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DEPARTMENT OF THE INTERIOR  
ALBERT B. FALL, SECRETARY  
UNITED STATES RECLAMATION SERVICE  
ARTHUR P. DAVIS, Director

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TWENTY-FIRST ANNUAL REPORT

OF THE

RECLAMATION SERVICE

Transmitted to Congress in pursuance of the Act of  
June 17, 1902 (32 Stat., 388)

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1921-1922



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1922



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Principal irrigation projects constructed and under construction by the United States Reclamation Service.

12/19/33  
A. Bureau of reclamation

# TWENTY-FIRST ANNUAL REPORT

OF THE

## RECLAMATION SERVICE. 2139 8818

### GENERAL DISCUSSION.

The 17th day of June, 1922, completed 20 years of the operation of the national reclamation act, approved June 17, 1902. The present report therefore presents an appropriate opportunity for consideration of the results of the operations under that act.

The original act has been supplemented by many amendments modifying or extending its provisions and the sum total of these enactments is known as the reclamation law. This law provides that the receipts from the sales of public lands, with small exception, and a percentage of the royalties from the production of oil, gas, potassium, etc., be paid into a fund known as the reclamation fund and used in the survey, construction, and operation of reclamation projects in the arid and semiarid States. The investment in construction during this period has been in round numbers \$135,000,000, of which about \$13,000,000 has been repaid.

This investment has accomplished the construction of works by which about 1,675,000 acres have been furnished with a complete water supply and about 1,100,000 additional acres have been furnished a supplemental supply under the provisions of the Warren Act. The latter are areas included in private or district projects and are not usually designated as Government projects. On the Government projects proper the area given comprises 31,462 farms, or an average area per farm of about 53 acres and these farms support upward of 30,000 families.

With the investment mentioned the service has excavated over 200,000,000 cubic yards of earth and rock, of which about 14,000,000 yards have been placed in dams, and canals have been built aggregating over 13,000 miles in length, including 27 miles of tunnels and 135 miles of flumes. The structures of all kinds and sizes number over 110,000. Some of the larger works constructed are the Roosevelt Dam in Arizona, 280 feet high; the Arrowrock in Idaho, 349 feet high; the Elephant Butte in New Mexico, 306 feet; and the Pathfinder and Shoshone Dams in Wyoming, 218 and 328 feet, respectively.

The works include other dams, canals, tunnels, flumes, drains, power plants, transmission lines, telephone lines, roads, railroads, pumping plants, and a variety of other classes of work incidental to the development of large irrigation projects.

The operation of the canal systems brings the employees of the Reclamation Service in close contact with the farmers and it is possible thus at trivial cost to obtain accurate statistics which are useful in studying the operations of the law. A condensation of these results is given in the adjoined tables and further details are included in the appendix of this report.

*Irrigable, irrigated, and cropped acreage, and crop value.*

Year.	Irrigable acreage.	Irrigated acreage.	Cropped acre- age.	Crop value.
1913.....	1,181,362	694,142	637,227	\$15,676,411
1914.....	1,240,575	761,271	703,424	16,475,517
1915.....	1,330,222	814,906	757,613	18,164,452
1916.....	1,405,452	922,821	858,291	32,815,972
1917.....	1,502,468	1,026,663	966,784	56,462,313
1918.....	1,601,384	1,119,566	1,051,193	68,321,396
1919.....	1,636,159	1,187,255	1,113,469	88,974,137
1920.....	1,661,000	1,226,490	1,153,820	66,171,650
1921.....	1,674,160	1,227,500	1,157,900	49,620,300
1922 <sup>1</sup> .....	1,700,000	1,250,000	1,175,000	

<sup>1</sup> Estimated.

The irrigable area in these tables is that acreage on the Government projects proper to which the service is able to deliver water. The difference between this area and that actually irrigated is represented chiefly by small undeveloped portions of the farms that are under cultivation and by the areas occupied by roads, ditches, buildings, etc. The difference between the acreage irrigated and the acreage cropped is accounted for chiefly by young orchard trees and young alfalfa not yet old enough for cropping. There are a few public land homesteads not yet taken on account of roughness or other objectionable qualities, and a few areas in nonresident ownership to which the law does not permit delivery of water, but these are relatively small in area.

The total estimated value of crops raised on the reclamation projects proper exclusive of those served under the Warren Act is about \$475,000,000. This does not include any allowance for increased value of live stock, which would increase the above figure, but is difficult to separate from the crop values because largely due to them. A census value of live stock in 1921 upon the projects proper was about \$20,000,000.

A table in the appendix contains a list of the special contracts under the Warren Act of February 21, 1911 (36 Stat. 925) entered into during the fiscal year ended June 30, 1922, for the delivery of water to lands in the vicinity of, but not primarily integral parts of, the reclamation projects and also summarizes the totals for previous years.

The reclamation projects have not been exempt from the vicissitudes of industrial conditions, and high prices were enjoyed in the years 1917, 1918, and 1919. They have likewise suffered severely from the rapid decline in values and available markets during the subsequent years, and although the acreage irrigated and cropped has continued to increase, the actual values realized in the last two years are less than those of the previous years. It will be noted by the table that the total values of the crops harvested in 1920 were about the same as those of 1918, although there were 100,000 more acres cropped. When it is remembered that the cost of preparing, seeding, and cultivating the fields was at its maximum when the crop of 1920 was planted, that values had declined before it could be marketed, and that the same principle holds for the crop of 1921, it will readily be realized that the farmers, confronted with heavy expenses and meager returns, were greatly handicapped in carrying on their operations and meeting the payments due the Government.

## REPAYMENTS.

The law provides certain rates of repayment and in a general way the time when these become due, although a large measure of discretion is vested in the Secretary of the Interior on the latter point. Payments past due incur penalties fixed by law.

Generally payments fall due in December and necessarily in the turnover of funds there are always payments that are due and collected, increasing suddenly when a new payment falls due and actually decreasing as payments are made.

The effect of the industrial depression and low prices for farm products upon the collection of the Reclamation Service is shown in the following table:

*Total amounts due and unpaid at end of each fiscal year.*

Year.	Construction.	Operation and maintenance.	Miscellaneous.	Total.	Per cent uncollected of total construction and operation and maintenance charges accrued.
.....	\$2,161,517.22	\$2,033,052.26	\$436,746.67	\$4,631,316.15	15.4
.....	1,123,874.98	1,483,398.96	694,478.70	3,301,752.64	12.3
.....	463,754.72	623,299.50	389,468.56	1,476,522.87	11.1
.....	521,758.72	560,607.77	218,217.30	1,300,583.82	8.0
.....	21,493.35	499,640.90	104,487.48	1,114,643.16	8.7
.....	510,514.78	419,756.93	367,231.34	1,297,503.05	9.8
.....	420,020.35	311,708.89	430,541.32	1,232,270.56	11.9
.....	489,939.54	291,009.91	278,984.44	1,059,933.89	15.6
.....	718,830.94				

## THE RELIEF ACT.

The financial condition of some of the settlers was recognized by Congress and an act was passed, Public No. 185, approved March 31, 1902, authorizing the Secretary of the Interior to extend the time for payment of charges due on reclamation projects with a reduction of rates and also to deliver water under certain circumstances to those who were delinquent in payments. In spite of the large losses suffered by all agricultural interests, including irrigated farming, the necessity for relief, though urgent in many cases, has been by no means universal.

It is of interest to review the applications for leniency under the act of March 31 that had been received at Washington when the fiscal year covered by this report had closed. The bulk of the applications were filed by that time, because the irrigation season is then advanced, and in general, the applications were connected with the right to receive water. The law applied to 13 projects upon which public notice had been issued and where the Secretary has authority to grant individual extensions under certain circumstances. Of those 13 projects, there are 5 upon which no applications for extension have been made. These are the Orland project, California, Carlsbad project, New Mexico, Umatilla and Klamath projects in Oregon, the Okanogan project in Washington, and the Sunnyside unit of the Yakima project in the same State. The Orland project in California not only has made no application for extension but has continued its splendid record of having at the present time not one cent delinquent in payment. It is notable

also that on the Newlands project, with 725 water-right applications, only one application for extension was received.

Out of many thousand water users, about 1,200 applications were made and about 1,000 approved, extending the time for payment of about \$277,000. This is about 5 per cent of those who might have applied and less than 7 per cent of the possible applicants upon the projects from which the applications were made.

Excluded from the foregoing discussion are several projects upon which public notice has not been issued, and the Rio Grande and Uncompahgre projects upon which it has been issued but has not yet taken effect. The Salt River project also has been excluded, because it was impossible to consider individual applications on that project, as it has been turned over to the water users' association under a contract by which that association operates the project, makes all collections, and is obligated to make all payments. The severe decline in the price of long-staple cotton, which the Salt River Valley was producing so heavily in 1918, 1919, and 1920, led to an acute stringency of financial conditions in that valley, and as individuals were not eligible to receive extensions, arrangements were made with the water users' association directly by which a portion of the payments were extended, under supplemental contract, providing for the payment of all dues and penalties at intervals, with the concluding payment in December, 1923.

All extensions of construction charges bear 6 per cent interest; delinquent charges not extended bear penalties of 1 per cent per month. The slowness with which collections were made, owing to the depression of 1920, had, of course, an immediate effect upon the funds available for construction work, so that in the fiscal year 1921 less than \$3,500,000 was available for construction, for not only did large delinquencies occur but the operation of the projects required an outlay of reclamation funds in order to keep crops growing, and this absorbed the major portion of the funds which actually were available.

*Reclamation fund collections, by months, during fiscal year 1922.*

July.....	\$153,485.04	February.....	\$3,398.77
August.....	113,781.92	March.....	\$57,745.02
September.....	179,981.46	April.....	71,854.26
October.....	162,715.88	May.....	400,928.96
November.....	360,134.47	June.....	424,715.58
December.....	628,288.80		237,.....
January.....	409,983.21	Total.....	4,294,56.....

The number of applicants for extension privileges is reassuring not only as to the financial condition on the projects but as to the attitude of the water users toward repayment. In some cases where the number of applicants was high, this is due in part to systematic propaganda by which some local interests sought to prevent the payments to the Government, preferring to keep the money at home, but this element has not been as important as the counter propaganda of those who from local pride and sense of honor have sought to discourage such applications and to make local arrangements by which the few unable to pay could be financed and the credit of the community upheld. It is significant also that even on the project where individual canvass was made to induce applications for extension, the number of applications was only 9 per cent of the total number of water users. The acid test of the industrial depression

just passed has demonstrated beyond any doubt not only the ability but the determination of nearly all of the water users to meet the payments required by law.

### ECONOMIC CONDITIONS.

The intensive study of individual and community conditions, which has been brought about by the depression and by the relief act, has brought out some interesting and instructive facts which, elucidated by statistics of the reclamation farm census, should be useful in reestablishing and maintaining prosperity upon the projects.

One fact of importance is that owing to a combination of conditions a large number of the water users abandoned the occupation of dairying to raise crops offering a higher immediate return. The first of these was cotton, affecting the most southern projects of the service. Next came sugar beets affecting many of the northern projects, and the high price of grain also had its effect on nearly all. To raise these crops alfalfa fields were plowed under and dairy herds were sacrificed, the dairy business being still further hampered by the high price of forage which followed. The sudden collapse of the market for the above favored products left the farmers with unsalable crops which had been raised at exceptionally high cost and even after the return of more normal times the condition can be remedied only by gradually returning to that most reliable of all farm industries on the projects, the dairy industry. This requires capital, skilled management, hard labor, and close application; but the projects are meeting the problem manfully and the dairy business is again coming into its own. Another fact brought out by the census study is the influence of the size of farms upon the crop values per acre and per farm.

A comparison of the projects on the basis of the average size of the cropped acreage per farm shows that on 24 projects from which statistics are available the one having the highest valuation of crops per acre and per farm is the Okanogan project in the State of Washington, where the average size of holding is only 12 acres and the gross value of product averages over \$300 per acre. Next in order is the Yakima project, where the average holding is 25 acres and the average gross production a little over \$100 per acre.

Dividing the projects into two groups we find that the 11 projects having the lowest acreage production had a cropped area per farm in 1921 averaging 54.6 acres and produced crops to the value of only \$19.57 per acre, or \$1,069 per farm. In contrast with these figures the combined statistics for the Umatilla, Grand Valley, Rio Grande, Strawberry Valley, Minidoka, Yuma, Boise, Uncompahgre, Carlsbad, Orland, Salt River, Yakima, and Okanogan projects show that their average cropped acreage per farm was only 31.9 acres, but that they produced crops to the average value of \$53.72 per acre, or \$1,715 per farm. These are summarized in the following table:

	First group.	Second group.
Average cropped.....	368, 530	789, 380
Value of crops.....	\$7, 214, 280	\$42, 406, 020
Number of farms.....	6, 744	24, 718
Average cropped acreage per farm.....	54.6	31.9
Average crop value per acre.....	\$19.57	\$53.72
Average crop value per farm.....	\$1, 069	\$1, 715

This illustrates the well-known fact demonstrated over and over again that irrigation farming to be successful must be intensive and that the means of the average settler enable him to handle properly an acreage that would be considered small in nonirrigated regions.

#### PROJECT OPERATIONS.

During the past year construction, operation, and maintenance of irrigation works have continued on 25 projects according to the provisions of the reclamation law.

In Arizona the Salt River project is operated by the water users' association under a contract with the Secretary of the Interior, under which the association assumes the management and operation of the project, and also the responsibility for any additions and extensions deemed desirable. Under the provisions of this contract the association has expended over \$1,000,000 upon drainage much needed in parts of the project. Where ground water is high, wells are provided and equipped with pumps to be operated by electricity developed on the project. The current can be used when not needed for other purposes, and its delivery thus stabilized. The pumps deliver the drainage water into the ditches, from which it is used for irrigation.

The Yuma project proper, Arizona-California, is operated by the Reclamation Service, and construction work has been confined mainly to extension of the drainage system. The annual menace of the floods of the Colorado is expensive, though by elaborate precautions and vigilance damage was averted this year. The Yuma Mesa auxiliary project was so far advanced that the delivery of pumped water on the mesa was begun in 1922. This enterprise is greatly handicapped by the high price of electric power necessary for the pumps. The development of power on the project is contemplated for this purpose.

The Orland project in California has continued its unique record of allowing no delinquencies of payment in either operation and maintenance or construction. Some lateral lining, to avoid seepage losses, was accomplished during the year.

The Grand Valley project, Colorado, is being operated on a rental basis, but the development is slow. No construction work was done except a few lateral extensions and the completion of drainage excavation done in cooperation with an adjoining district.

On the Uncompahgre project, Colorado, public notice has been issued, and will take effect December 1, 1922, as provided in the contract of four years ago. Some lateral improvement and extension is the only construction done during the past year.

In Idaho the Boise project was operated under public notice, in accordance with a court decree resulting from a suit brought for the water users to test the validity of the charges. The decree provides fully for the return of all moneys invested in the project and contemplates that money expended on drainage shall be collected in advance as operation and maintenance charges. Only a small amount has been thus advanced, and drainage is badly needed in a part of the valley.

On the King Hill project, Idaho, some important structures were built and the work covered by the contract with the project district is about three-fourths completed. This is reconstruction of a system failing under private development, substituting concrete for wood and otherwise improving the original construction.

The gravity portion of the Minidoka project, Idaho, is operated by an irrigation district, which is successfully conducted and prosperous. The pumping division is operated by the Government. No construction work has been done on these divisions during the past year. An extension for pumping to a tract of fine land north of the gravity division has been under investigation and contemplation for some years. It requires the construction of a large storage reservoir to provide the necessary water supply. Such a reservoir is found feasible at American Falls, where practically all of the flow from the Upper Snake River Basin can be impounded. It would supply much needed storage water to a large number of canals already in service under private and district management; 32 such organizations have entered into contracts to advance their proportionate cost of the proposed reservoir, and made some preliminary payments. They have been prevented by the prevailing agricultural depression from fully carrying out these contracts, and the work on the reservoir is accordingly suspended. A movement is on foot to form a large district covering the interested canals, and to issue bonds for raising the necessary funds to construct the reservoir. This movement appears promising.

The Huntley project in Montana was completed years ago and is operated under public notice, but negotiations are under way which it is hoped will result in the assumption of its operation by the water users.

The Milk River project, Montana, is still on a rental basis. Current construction work comprises the enlargement of the Nelson Reservoir and some lateral extensions.

The Fort Shaw division of the Sun River project, Montana, has been operated under public notice for some years. A portion of it needs drainage, but the settlers have not complied with the conditions necessary to correct it. When the canal system on the north side was under construction the settlers holding entries of public lands protested vigorously against its construction, declaring that irrigation was not necessary and not desired and demanded repeatedly that the work be stopped. In view of this attitude no steps have been taken to provide storage. The canals and laterals are capable of serving over 30,000 acres of land with the flood waters of May, June, and July, and in some years there is a season's supply for this acreage from the natural flow of Sun River. This water is being delivered to those desiring to use it on a rental basis, and is of substantial benefit.

The Lower Yellowstone project is interstate, and two irrigation districts have been formed, one in Montana and one in North Dakota. Both have entered into contracts with the Government to repay the construction costs.

The North Platte project is interstate and is one of the largest yet undertaken. Water is stored in the Pathfinder Reservoir, and diverted at Whalen in Wyoming for lands in that State and Nebraska. It serves about 180,000 acres on the north side of the river from a series of canals and small reservoirs which are nearly completed. Work is in progress on the canal system on the south side, which will serve about 100,000 acres, and a portion of the lands under this system have been opened to entry and settled by ex-soldiers. A large number of private canals have been served with water stored in Pathfinder Reservoir, and to serve the completed project another reservoir above Guernsey, Wyo., is contemplated.



The Newlands project in Nevada is being operated under public notice. Drainage is needed and a contract with the irrigation district has been ratified under which drainage works are being constructed, and the results are satisfactory. Further storage is needed, and a reservoir is contemplated for the conservation of the waters of the Truckee River in a site to be built in Spanish Springs Valley, north of Reno. This will serve the lands that are too high to be served by the Lahontan Reservoir already built on the Carson River for the lower lands.

The Carlsbad project in New Mexico is completed and is being operated under public notice. Investigations are under way to ascertain the feasibility of an additional reservoir on the Pecos River, to serve additional lands near Fort Sumner and elsewhere.

The Rio Grande project is interstate and international. It serves lands in New Mexico and Texas, and in accordance with treaty provisions delivers stored water from Elephant Butte Reservoir to the Mexican canals opposite El Paso. In compliance with urgent requests from the irrigators the service is gradually taking title to the ancient lateral systems, enlarging them and fitting them with permanent structures to adapt them to the needs of the project. A system of drainage is being provided on this project, under contracts with the irrigation districts which guarantee repayment.

At Williston, N. Dak., the service is operating a pumping project somewhat experimental in its nature and which has not yet demonstrated its ability to pay for itself. Lignite is mined by the service and burned under boilers to generate the power used in the irrigation pumping. From the same plant electric current has been furnished the city for lighting. The income from the latter operation has lessened a deficit on the former. If a favorable contract can not be continued with the city, it will be necessary to discontinue both operations.

The Umatilla project in northern Oregon is operated by the Government. The soil is mostly sandy, but fertile when abundantly watered. A number of private canals antedating the Government project have a supply of water from the natural flow of the river, during the spring, but are greatly in need of a summer supply. This can be furnished by storing the winter waters on McKay Creek, where a reservoir is contemplated for this purpose.

The Klamath project, in southern Oregon and northern California, is being operated under public notice. The diversion of the waters of Lost River into Klamath River is gradually lowering the level of Tule Lake into which Lost River naturally flows. The land uncovered is of excellent quality, and is being provided with canals for irrigation. A large tract of this land will soon be opened to entry. Drainage has been provided for the part of the project needing it, and has been effective. An additional reservoir to serve the upper lands is contemplated in Horsefly Valley. This will further deplete the supply to Tule Lake, and permit evaporation to uncover more land.

The Belle Fourche project in South Dakota is operated by the Reclamation Service under public notice and is nearly completed. Small lateral extensions were the only construction carried on during the past year.

In Utah the Strawberry Valley project has been operated by the United States for years on the basis of public notice involving annual repayments of its construction cost by the irrigators, who are negotiating to take over its management and operation.

The Okanogan project in Washington has suffered shortage of water on account of small precipitation in its basin. Notwithstanding this, it still holds the record for the highest acreage values produced on any project of the Reclamation Service. The reservoir capacity has been enlarged and provisions for pumping have been provided to supplement the water supply.

The Yakima project, Washington, includes two main divisions, the Sunnyside and the Tieton. Both are operated by the Reclamation Service under public notice. In addition to this a large area on the Yakima Indian Reservation is served with water from the reservoirs constructed by the Reclamation Service. Additional storage is needed, and to provide this a large dam is now under construction on the Tieton River, which will be one of the largest structures built by this service. This will require two more years for completion.

The Riverton project in Wyoming is a new project authorized and undertaken by Congress in the Indian appropriation act for 1921. Construction work is being pushed but no land can as yet be irrigated.

The Shoshone project in the same State is operated by the Service under public notice. Drainage works are under construction and work is in progress on a diversion dam and canal system to serve the lands of the Willwood division south of the Shoshone River. A small power plant at Shoshone Dam was completed the past year, to furnish power for construction purposes.

## Irrigation and crop results, Government reclamation projects, 1921.

State and project.	Lands on projects proper covered by crop census.				Other lands served by Government works, usually a partial water supply through private canals under Warren Act contracts.						
	Irrigable acreage. <sup>1</sup>	Irrigated acreage. <sup>2</sup>	Cropped acreage. <sup>3</sup>	Crop value.		Irrigable acreage.	Irrigated acreage.	Cropped acreage.	Crop value.		Approximate percentage of total water used supplied by United States.
				Total.	Per acre.				Total.	Average per acre.	
Arizona:											
Salt River <sup>1</sup> .....	213,000	202,430	191,000	\$11,435,380	\$59.87						
Arizona-California:											
Yuma.....	62,000	52,400	52,400	2,098,060	40.04	4,000	1,500	1,300	\$82,000	\$40.00	100
California:											
Orland.....	20,480	14,700	11,450	495,810	43.30						
Colorado:											
Grand Valley.....	35,000	12,300	11,390	356,730	31.32	8,350	7,900	7,800	1,175,000	151.00	100
Uncompaghe.....	100,000	63,760	63,600	2,614,300	41.10	420		360	48,400	134.00	
Idaho:											
Boise.....	143,000	111,500	103,340	4,203,940	40.08	140,000	130,200	125,900	4,675,700	37.17	20
King Hill <sup>2</sup> .....	13,650	5,900	5,390	119,210	22.20						
Minnesota:											
Gravity division <sup>3</sup> .....	72,590	60,650	57,400	1,611,140	28.59	680,000	580,000	560,000	18,548,750	33.12	16
Pumping division.....	48,970	46,580	43,320	1,768,140	40.81						
Montana:											
Hunley.....	31,630	18,800	18,440	440,770	23.90						
Milk River <sup>4</sup> .....	69,200	16,400	16,110	129,830	8.06		28,300	23,800	228,250	9.60	
Sun River.....											
Fort Shaw division <sup>5</sup> .....	14,260	8,910	8,700	117,440	13.49						
Greenhads division <sup>10</sup> .....	19,420	12,810	12,390	172,910	13.96						
Montana-North Dakota:											
Lower Yellowstone <sup>11</sup> .....	42,170	19,980	19,980	304,220	15.23						
Nebraska-Wyoming:											
North Platte.....											
North Platte Canal & Colonization Co. lands.....	15,000	11,020	10,890	330,940	30.40						
Interstate division.....	115,000	86,380	85,580	2,403,920	28.12						
Fort Laramie division.....	16,000	12,150	12,150	188,930	13.95						
Northport division.....	2,500	2,250	1,900	35,900	20.00						
Nevada:											
Newlands.....	72,200	46,160	43,440	1,254,680	18.35.37	105,400	87,400	84,400	3,275,500	37.48	42½

New Mexico:	25,000	24,810	21,620	\$919,650	\$411.53	70,000	26,000	26,000	\$573,000	924.17	100
California:	115,000	85,590	77,660	2,486,710	32.11						
New Mexico-Texas:											
Rio Grande:											
North Dakota:	7,650	2,080	1,900	54,320	27.70						
North Dakota pumping:											
Oregon:											
Umatilla:	24,400	13,150	11,610	343,890	29.62						
Oregon-California:	50,000	36,100	32,720	431,950	13.20	45,000	21,200	20,000	292,700	14.63	
Klamath:						40	40	40	330	7.50	100
South Dakota:	93,380	55,100	55,100	513,780	9.32						
Bella Fourche:											
Utah:	52,500	32,500	31,380	1,020,590	32.52	17,800	10,300	15,800	536,500	24.00	25
Strawberry Valley:											
Washington:											
Oregon:	6,500	5,650	5,330	2,051,270	385.00						
Yakima:											
Sunnyside division:	101,500	94,500	80,680	7,797,000	92.65						
Piston division:	83,000	28,500	27,500	3,166,410	116.40						
Wyoming:											
Shoshone:											
Garland division:	43,650	34,870	34,170	632,460	18.54						
Frankie division:	27,170	10,860	9,710	79,060	8.15						
Total:	1,671,100	1,227,500	1,157,900	49,620,300	42.85	1,146,810	1,001,250	969,550	44,006,120	46.84	

1 Data are for calendar year (irrigation season), except in Salt River project, where data are for corresponding "agricultural year," October, 1920, to September, 1921.

2 Areas Reclamation Service was prepared to supply water.

3 Irrigated crops. Excludes small areas on few projects cropped by dry farming.

4 Data furnished by Salt River Valley Water Users' Association, which operated the project.

5 Includes 5,536 acres reported as vacant, 3,032 acres of "home tracts" and 2,862 acres within townsites, on which no crops were reported.

6 Data furnished by King Hill Irrigation district. The project was built under private auspices and is under reconstruction by the United States.

7 Data furnished by Minidoka Irrigation district, which operated the division.

8 Crop reports covered an additional area of 12,490 acres or 10.4 per cent of dry farming, producing crops worth \$142,300, or \$11.40 per acre.

9 Figures are for 208 irrigated farms, covering an irrigated acreage of 8,880, in addition to which there were irrigated in townsites 22 acres, and for miscellaneous purposes, 8 acres.

10 Crop reports covered an additional area of 9,987 acres or 10.4 per cent of dry farming, producing crops worth \$90,600, or \$8.33 per acre.

11 Figures are for 169 irrigated farms, all but 450 acres of which produced crops.

12 Crop reports covered an additional area of 9,987 acres or 10.4 per cent of dry farming, producing crops worth \$90,600, or \$8.33 per acre.

13 For crops in full production, excluding 7,571 acres of wild grass pasture and 3,170 acres otherwise not in full production. For all crops, \$23.88.

# 12 TWENTY-FIRST ANNUAL REPORT OF RECLAMATION SERVICE.

## Summary of crop reports on reclamation projects in 1921.

NOTE.—These figures are limited to irrigated crops covered by crop census on Government projects proper, excluding dry-farm crops and all crops in most areas served stored water under the Warren Act.

Crop.	Acreage cropped.		Yields.			Crop value.		
	Total.	Per cent.	Unit.	Total.	Average per acre.	Average per acre.	Total.	Per cent.
<b>Cereals:</b>								
Barley.....	33,574	2.9	Bushels.	1,080,310	32	\$16.66	\$559,327	1.1
Corn.....	52,406	4.6	do.	1,301,707	25	14.65	769,228	1.6
Oats.....	55,427	9.8	do.	1,601,124	29	10.42	877,787	1.2
Rye.....	1,511	.1	do.	20,253	13	8.61	13,011	.....
Wheat.....	156,621	13.6	do.	3,655,728	23	26.29	3,116,862	6.3
<b>Total.....</b>	<b>290,639</b>	<b>26</b>		<b>7,669,122</b>	<b>26</b>	<b>16.80</b>	<b>5,036,215</b>	<b>10.2</b>
<b>Other grain and seed:</b>								
Alfalfa seed.....	19,571	1.7	Bushels.	69,093	3.5	29.20	571,447	1.2
Clover seed.....	10,804	.9	do.	50,947	4.7	36.40	393,316	.8
Grain sorghum.....	36,548	3.2	do.	1,246,889	34	21.14	772,615	1.5
Flaxseed.....	376	.....	do.	1,534	4	6	2,232	.....
Millet seed.....	243	.....	do.	1,769	7	7.20	1,747	.....
<b>Total.....</b>	<b>67,542</b>	<b>5.8</b>		<b>1,370,232</b>	<b>.....</b>	<b>25.76</b>	<b>1,741,357</b>	<b>3.5</b>
<b>Hay and forage:</b>								
Alfalfa hay.....	460,523	39.8	Tons.....	1,418,950	3	23	10,505,944	21.2
Clover hay.....	10,998	.9	do.	18,022	1.7	7	75,541	.1
Other hay.....	28,345	2.4	do.	53,079	1.8	14.55	412,475	.9
Corn fodder.....	8,426	.5	do.	19,654	3.6	13	70,891	.1
Other forage.....	4,119	.4	do.	12,901	3.1	20.91	86,130	.2
Pasture.....	128,418	10.6	.....	.....	.....	9.13	1,118,086	2.2
<b>Total.....</b>	<b>631,829</b>	<b>54.6</b>				<b>19.42</b>	<b>12,268,567</b>	<b>24.7</b>
<b>Vegetables and truck:</b>								
Beans.....	2,564	.2	Bushels.	38,802	15	48	122,470	.3
Onions.....	573	.....	do.	175,411	306	446	255,636	.5
Potatoes, white.....	51,559	4.5	do.	9,914,040	192	142.86	7,866,051	14.8
Potatoes, sweet.....	702	.....	do.	107,029	152	123.77	86,890	.2
Truck.....	19,506	1.7	.....	.....	.....	119.61	2,333,174	4.7
<b>Total.....</b>	<b>74,904</b>	<b>6.4</b>				<b>135.79</b>	<b>10,164,121</b>	<b>20.5</b>
<b>Fruits and nuts:</b>								
Apples.....	27,560	2.4	Pounds	238,317,915	8.647	288.97	7,964,106	16
Peaches.....	1,980	.1	do.	10,333,637	5.219	200	396,428	.8
Pears.....	3,747	.4	do.	18,046,108	4.816	135.40	507,284	1.2
Prunes.....	1,186	.1	do.	5,292,962	4.464	145	171,846	.3
Citrus fruits.....	1,818	.1	do.	12,078,800	6.641	368.07	663,702	1.3
Small fruits.....	1,545	.1	do.	4,062,937	2.643	333.13	514,689	1
Miscellaneous.....	2,669	.2	do.	8,242,000	3.088	122.74	327,592	.6
<b>Total.....</b>	<b>40,605</b>	<b>3.4</b>		<b>296,389,359</b>	<b>7.317</b>	<b>260.35</b>	<b>10,545,647</b>	<b>21.2</b>
<b>Miscellaneous:</b>								
Sugar beets.....	40,896	3.5	Tons.....	423,442	10.3	66	2,690,001	5.4
Cotton.....	102,087	9.0	Pounds	3,890,210	87	65.51	6,688,196	13.5
Cotton seed.....	1,953	.1	Tons.....	66,420,800	650	20.83	40,683	.1
Cane.....	8,268	.7	.....	6,364	3.2	53.88	445,514	.9
Other crops.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Total.....</b>	<b>153,203</b>	<b>13.3</b>				<b>64.39</b>	<b>9,864,393</b>	<b>19.9</b>
Duplication.....	109,722	9.5						
All crops.....	1,157,900	100.0				<b>42.85</b>	<b>49,620,300</b>	<b>100.0</b>

## SUMMARY OF CONSTRUCTION RESULTS, JUNE 30, 1922.

Items.	To June 30, 1922.		To June 30, 1921.		Increase.	
Reservoir capacity available (original).....	<i>Acres-feet.</i> 9,679,798		<i>Acres-feet.</i> 9,600,423		<i>Acres-feet.</i> 79,375	
<b>CANALS, DITCHES, AND DRAINS.</b>						
	<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>	
Canals over 800 second-feet capacity.....	506		472		34	
Canals 301 to 800 second-feet capacity.....	678		678		.....	
Canals 50 to 300 second-feet capacity.....	2,086		2,036		50	
Canals less than 50 second-feet capacity.....	8,310		8,072		238	
Total canals.....	11,580		11,258		322	
Waste-water ditches.....	809		732		77	
Drains, open.....	1,015		867		148	
Drains, closed.....	189		189		.....	
Total.....	2,013		1,788		225	
Grand total.....	13,593		13,046		547	
<b>TUNNELS.</b>						
Number.....	101		96		5	
Length (feet).....	145,436		144,429		1,007	
<b>STORAGE AND DIVERSION DAMS.</b>						
	<i>Cubic yards.</i>		<i>Cubic yards.</i>		<i>Cubic yards.</i>	
Masonry.....	2,102,463		2,089,096		13,367	
Earth.....	11,102,524		10,669,414		433,110	
Rockfill and crib.....	1,285,589		1,211,499		74,090	
Total.....	14,490,576		13,970,009		520,567	
<b>DIKES AND LEVEES.</b>						
Length and volume.....	<i>Feet.</i> 649,397	<i>Cu. yds.</i> 4,719,186	<i>Feet.</i> 601,914	<i>Cu. yds.</i> 4,576,891	<i>Feet.</i> 47,483	<i>Cu. yds.</i> 142,295
	Concrete.	Wood.	Concrete.	Wood.	Concrete.	Wood.
<b>CANAL STRUCTURES.</b>						
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
Costing over \$2,000.....	1,207	209	1,153	209	54	.....
Costing \$500 to \$2,000.....	2,675	762	2,572	658	103	104
Costing \$100 to \$500.....	12,705	7,826	11,225	6,924	1,480	902
Costing less than \$100.....	23,186	68,587	20,519	65,422	2,067	3,465
Total.....	39,773	77,684	35,469	78,213	4,304	4,471
Grand total.....	117,457		108,682		8,775	
<b>BRIDGES.</b>						
	Number.	Length.	Number.	Length.	Number.	Length.
		<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Steel.....	106	8,664	106	8,579	.....	85
Combination.....	414	12,542	414	12,542	.....	.....
Wood.....	7,398	168,112	6,862	155,531	526	12,581
Concrete.....	352	4,664	352	4,664	.....	.....
Total.....	8,260	193,982	7,734	181,316	526	12,666
<b>CULVERTS.</b>						
Concrete.....	2,422	119,777	2,125	106,310	297	13,467
Metal.....	2,013	70,030	1,761	61,810	252	8,220
Terra cotta.....	1,706	69,537	1,556	66,362	149	3,175
Wood.....	4,189	101,801	4,189	101,801	.....	.....
Total.....	10,329	361,145	9,631	336,283	698	24,862
<b>PIPE.</b>						
	<i>Linear feet.</i>		<i>Linear feet.</i>		<i>Linear feet.</i>	
Concrete.....	770,823		683,497		87,326	
Metal.....	272,810		259,821		12,989	
Terra cotta (tile).....	1,428,261		1,384,725		43,536	
Wood.....	532,240		506,928		26,312	
Total.....	3,004,134		2,833,971		170,163	

*Summary of construction results, June 30, 1923—Continued.*

Items.	To June 30, 1922.		To June 30, 1921.		Increase.	
	Number.	Length.	Number.	Length.	Number.	Length.
FLUMES.						
Concrete.....	98	<i>Feet.</i> 65,121	92	<i>Feet.</i> 45,125	6	<i>Feet.</i> 19,996
Metal.....	1,148	185,067	1,061	174,734	87	10,333
Wood.....	2,419	477,258	2,351	471,464	68	5,794
Total.....	3,665	727,446	3,504	691,323	161	36,123
CANALS LINED.						
	Concrete.	Wood.	Concrete.	Wood.	Concrete.	Wood.
Length (miles).....	378.50	4.12	353.94	4.12	24.56	.....
Total.....	382.62		358.06		24.56	
BUILDINGS.						
	<i>Number.</i>		<i>Number.</i>		<i>Number.</i>	
Offices.....	99		99		.....	
Residences.....	715		681		34	
Power plants.....	31		31		.....	
Pumping stations.....	165		136		29	
Barns, storehouses, etc.....	561		561		10	
Total.....	1,571		1,498		73	
	Number.	Depth.	Number.	Depth.	Number.	Depth.
WELLS.						
Number and depth.....	356	<i>Feet.</i> 52,821	532	<i>Feet.</i> 51,435	24	<i>Feet.</i> 1,386
COMMUNICATIONS.						
	<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>	
Roads.....	1,038		1,035		3	
Railroads.....	83		83		.....	
Telephone lines.....	3,284		3,269		15	
Transmission lines.....	841		714		127	
Total.....	5,246		5,101		145	
POWER DEVELOPED.						
Water and steam, horsepower.....	63,973		60,373		3,600	
EXCAVATION.						
	<i>Cubic yards.</i>		<i>Cubic yards.</i>		<i>Cubic yards.</i>	
Class 1, earth.....	180,226,211		168,588,794		11,637,417	
Class 2, indurated material.....	11,248,053		10,656,971		591,082	
Class 3, rock.....	9,103,255		8,787,724		315,531	
Total.....	200,577,519		188,033,489		12,544,030	
RIPRAP (cubic yards).....	2,260,756		2,073,073		187,683	
PAVING (square yards).....	924,674		899,084		25,590	
CONCRETE (cubic yards).....	3,169,403		3,092,888		75,515	
CEMENT (barrels).....	3,181,124		3,078,892		102,232	

## DRAINAGE.

Estimate of seepage and summary of drainage work to June 30, 1922.

State and project.	Constructed drains. <sup>1</sup>		Estimated area damaged by seepage on June 30, 1922.	Estimated area protected by constructed drains.	Estimated area that will be protected when all drains authorized have been constructed.
	Open.	Closed.			
	Miles.	Miles.	Acres.	Acres.	Acres.
Arizona: Salt River <sup>2</sup> .....					
California:					
Yuma.....					
Reservation.....	11.70	4.00		8,000	8,000
Yuma Valley.....	33.10			29,000	30,000
Colorado:					
Grand Valley—					
Project lands.....	16.80		600	2,400	2,700
Grand Valley drainage district.....	38.30	1.00	29,000	10,000	10,000
Teller Institute.....	2.80			300	300
Frey Drain.....	1.60			300	300
Uncompahgre <sup>3</sup> .....		94.00	16,000	9,200	9,200
Idaho:					
Boise—					
Riverside irrigation district.....	44.10		350	11,400	11,400
Pioneer irrigation district.....	78.50	.40	300	30,000	30,000
Nampa-Meridian irrigation district.....	43.70		500	50,000	50,000
Other parts.....	15.24	.10	6,000	5,000	10,000
King Hill <sup>4</sup> .....	.30			600	600
Minidoka (gravity division).....	109.00		560	30,000	30,000
Montana:					
Flathead (Indian).....	.18		640	1,240	1,240
Huntley.....	16.78	50.50	1,200	21,500	21,500
Milk River—					
Malta division.....	1.3		1,520	100	130
Glasgow division.....			100		
Sun River—					
Fort Shaw division.....			2,485		
Greenfields division.....			800		
Montana-North Dakota:					
Lower Yellowstone.....	4.56	1.10	1,600	1,600	1,600
Nebraska-Wyoming:					
North Platte—					
Interstate division.....	27.13	14.18	2,460	5,740	8,200
Interstate division <sup>5</sup> .....	43.26				
Fort Laramie division.....	34.63				
Northport division.....	.48		350	100	15,600
Nevada:					
Newlands—					
Carson division.....	56.51	3.99	13,700	24,000	62,816
Truckee division.....	6.35		560	1,000	4,448
New Mexico:					
Carlsbad.....	11.14	3.65	5,500	5,031	5,031
New Mexico-Texas:					
Rio Grande—					
Rincon division.....	7.99		9,000	3,500	17,000
Leasburg division.....	46.10		6,000	22,000	31,000
Mesilla division <sup>6</sup> .....	105.80		4,000	42,000	47,000
El Paso division <sup>6</sup> .....	85.30		11,000	35,000	55,000
Oregon:					
Umatilla.....	10.00		300	2,000	2,000
Klamath.....	100.10	8.00	2,000	28,686	29,686
South Dakota:					
Belle Fourche.....			3,921		
Utah:					
Strawberry Valley <sup>7</sup> .....	18.90	71.50	8,500	11,422	19,922
Washington:					
Yakima—					
Sunnyside division <sup>7</sup> .....	82.85	86.57	10,000	50,357	50,357
Tieton division <sup>7</sup> .....	6.80	1.20	200	2,068	2,068
Wyoming:					
Shoshone—					
South Garland division.....	25.67	89.06	800	25,700	26,000
North Garland division.....	27.04	2.27	3,000	6,000	9,000
West Garland division.....	1.00	1.24	200	500	500
Franklin division.....	13.80		3,500	2,400	27,500
Total.....	1,128.31	435.72	146,646	478,144	633,098

<sup>1</sup> Surface drains and waste ditches not included.

<sup>2</sup> Pumping and drainage plants have produced marked effect in lowering water table in certain areas.

<sup>3</sup> Constructed by landowners, water users, or drainage districts.

<sup>4</sup> Outlet channels, of which 7.74 miles were built by the United States as a part of the project drainage, 17.26 miles by the United States under cooperative contracts, 16.17 miles by the Farmers irrigation district, and 2 miles by the Morrill drainage district.

<sup>5</sup> Includes 1.7 miles of temporary outlet abandoned.

<sup>6</sup> Includes 0.4 mile of temporary outlet to be abandoned.

<sup>7</sup> All drainage work done by county drainage engineer through drainage improvement districts.



## POWER AND PUMPING.

*Power plants operated by the United States Reclamation Service during the fiscal year 1921-22.*

Project.	Name of plant.	Station capacity.	Number of units.	Head.	First cost of plant.	Cost of operation.	Estimated depreciation.	Cost per kilowatt-hour, exclusive of depreciation.	Output.	Distribution of power generated (kilowatt hours).			Losses.	Gross power sales.
										Sold to consumers.	Used for irrigation pumping.	Used for other purposes.		
		Kt-a.		Fed.					Kilowatt hours.					
Boise.....	Boise.....	1,875	2	20.0	\$187,000.37	80,592.00	\$5,540.00	0.001678	5,716,068	5,532,476	.....	183,622	.....	\$11,000.00
Minidoka.....	Minidoka.....	7,000	6	43.21	453,317.40	20,510.22	15,012.00	0.00437	46,905,120	21,433,332	21,549,912	633,381	3,319,475	128,913.46
Newlands.....	Lehonton <sup>1</sup> .....	1,875	3	110	133,612.00	2,770.24	2,770.24	.....	6,927,350	6,898,562	.....	28,788	.....	21,978.34
North Dakota Pumping.....	Williston.....	1,150	4	.....	176,903.30	69,344.20	3,000.00	0.034138	2,061,268	1,083,892	469,639	373,817	93,950	77,424.41
North Platte.....	Lingle.....	760	2	105	97,314.00	13,295.55	6,900.00	0.050438	2,633,700	897,660	.....	1,203,290	532,750	27,407.19
Okanogan.....	Power Plant No. 1.....	187	1	108	11,923.44	785.37	.....	0.17768	44,200	.....	44,200	.....	.....	.....
	Power Plant No. 2.....	187	1	55	13,931.42	1,420.32	.....	0.13335	106,510	.....	106,510	.....	.....	.....
	Emergency Power Plant No. 3 <sup>2</sup> .....	187	1	.....	24,276.27	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rio Grande.....	Elephant Butte No. 2.....	1,050	1	153.23	8,440.00	3,746.18	.....	0.489077	76,598	.....	.....	76,598	.....	.....
Salt River <sup>3</sup> .....	Arizona Falls.....	600	2	19	109,500.73	7,273.14	5,475.00	0.02899	2,535,200	.....	.....	.....	.....	.....
	Chandler.....	600	1	40	91,900.94	11,081.50	4,590.54	0.03243	3,416,900	.....	.....	.....	.....	.....
	Crescent.....	5,250	6	111	753,147.26	31,162.35	37,757.36	0.01942	16,914,400	10,424,523	9,461,811	64,411	6,060,049	554,305.56
	Roosevelt.....	11,750	6	80-225	870,317.94	90,862.67	43,515.98	0.01875	8,195,400	.....	.....	.....	.....	.....
	South Consolidated.....	2,000	2	23	163,139.50	10,527.03	8,155.98	0.02091	5,035,400	.....	.....	.....	.....	.....
	Shoshone.....	2,000	2	140-220	577,667.00	1,625.00	3,788.00	0.21494	1,347,588	17,600	.....	24,820	33,200	812.10
	Spanish Fork.....	1,000	2	123.5	60,724.80	15,669.38	3,033.72	0.11021	1,247,588	1,131,747	.....	143,501	72,260	22,035.51
	Tieton No. 1.....	1,270	2	45	40,000.00	473.94	1,005.32	0.05275	89,850	.....	.....	89,850	.....	.....
	Tieton No. 2.....	1,000	2	74	76,753.16	9,295.81	18,474.56	0.04542	1,919,590	.....	.....	1,919,590	.....	.....
	Rocky Ford.....	187	1	73	23,000.00	( <sup>4</sup> )	1,036.00	0.04542	700,100	.....	700,100	.....	.....	.....

<sup>1</sup> Power plant and transmission line leased to the Canyon Power Co. for 10 years beginning Dec. 1, 1914.

<sup>2</sup> No longer operated, partially dismantled.

<sup>3</sup> Power plants operated by Salt River Valley Water Users' Association.

<sup>4</sup> As all plants fed into common transmission line, segregation is impossible.

<sup>5</sup> Not available.

Principal contracts for the sale of power in Iowa June 30, 1922.

Project.	Name of contractor.	Date of contract.	Date of expiration.	Maximum load.	Rate per kilowatt-hour.	Gross income, fiscal year 1921-22.	Remarks.
Bols. Mundaka.	Idaho Power Co.	Apr. 1, 1921	Mar. 31, 1923	7-67	Mundaka standard.	\$11,000.00	75 cents per kilowatt month for first 50 kilowatt; heat. Power only. Do. Heat. All less than \$1,000 per year. Minimum monthly charge \$1,200, April to September, inclusive. No power delivered during fiscal year 1922.
	Amalgamated Sugar Co.	May 1, 1923	Feb. 28, 1926	200-3,000	do.	1,297.87	
	City of Burlington	Jan. 1, 1920	Jan. 1, 1920	150-2,000	do.	51,667.90	
	City of Rupert	do.	do.	15	do.	26,415.24	
	East End Electric Co.	Jan. 23, 1918	Jan. 23, 1926	15	do.	1,180.23	
	Perry Light & Power Co.	Mar. 12, 1919	Mar. 12, 1920	15	do.	1,001.10	
	Melcher Mining & Milling Co.	July 27, 1917	July 27, 1922	120-200	do.	3,391.20	
	Mundaka irrigation district.	Jan. 27, 1917	Feb. 13, 1924	Req. of irrig.	\$0.03.	6,350.47	
	Paul Electric Co.	Jan. 20, 1914	Nov. 30, 1924	100-500	Mundaka standard.	2,554.10	
	Rural Electric Co.	Nov. 1, 1919	Mar. 31, 1927	11-15	do.	1,137.15	
Newlands.	Unity Light & Power Co.	Mar. 19, 1917	Mar. 19, 1927	30-41	do.	2,772.53	All less than \$1,000 per year. Minimum monthly charge \$1,200, April to September, inclusive. No power delivered during fiscal year 1922.
	Village of Albion	Oct. 15, 1915	Jan. 8, 1926	30-100	do.	5,010.26	
	Do.	Sept. 15, 1916	do.	200-41	\$1.25 per kilowatt-month.	2,082.50	
	Village of Dredg.	Oct. 26, 1920	Nov. 1, 1930	30-41	Mundaka standard.	2,087.82	
	Village of Hoyburn.	Mar. 9, 1920	Jan. 1, 1930	50-200	do.	2,624.61	
	55 small contracts.	July 10, 1914	Nov. 30, 1924	1,500	1 to 1 cents.	7,893.63	
	Cañon Power Co.	Oct. 16, 1912	Dec. 20, 1922	600	24 to 54 cents.	21,744.39	
	City of Williston, N. Dak.	Apr. 23, 1922	Apr. 30, 1924	135	North Platte standard.	51,973.53	
	City of Mitchell, Nebr.	May 10, 1921	May 10, 1923	125	do.	11,010.73	
	Platte Valley Power Co.	May 1, 1922	June 21, 1929	25	do.	10,260.88	
Shoshone.	Security Land Co.	Feb. 9, 1922	Feb. 9, 1927	25	do.	25.24	No power delivered during fiscal year 1922.
	Village of Lingle, Wyo.	Oct. 27, 1919	Oct. 26, 1924	25	do.	1,774.86	
	Village of Merrill, Nebr.	Apr. 28, 1922	Apr. 30, 1924	55	do.	4,283.40	
	City of Powell, Wyo.	Sept. 21, 1921	Oct. 1, 1923	100	1 cent to 6 cents per kilowatt-hour.	812.10	
	Castilla Hot Springs Co.	Sept. 6, 1919	Sept. 6, 1924	10	Standard; minimum \$15 per month.	201.44	
	Joseph Lucas	Feb. 15, 1922	Feb. 21, 1925	5	9 cents; minimum \$3 per month.	36.15	
	Keeler Electric Co.	Apr. 9, 1921	Apr. 9, 1926	5	Standard; minimum \$7.50 per month.	91.93	
	Mapleton Light & Power Co.	May 31, 1919	May 31, 1924	5	do.	96.08	
	Payson City	Feb. 3, 1922	Feb. 5, 1925	120	do.	8,485.57	
	Salem City	do.	do.	40	do.	1,670.61	
Strawberry Valley.	Spanish Fork City	do.	do.	200	do.	9,661.68	No power delivered during fiscal year 1922.
	Springville City	July 26, 1920	July 26, 1923	125	1 to 2 cents; minimum \$50 per month.	1,716.60	

Pumping plants operated by the United States Reclamation Service during fiscal year 1921-22.

Project.	Name of plant.	Type of pumping unit. <sup>1</sup>	Plant capacity.	Number of units.	Net lift.	First cost of plant.	Cost of operation.	Estimated depreciation.	Energy used for pumping.	Acres-foot pumped.	Cost per acre-foot without depreciation.	
											Per acre-foot.	Per foot lift.
Grand Valley Humfrey	Price Sub.	V. T. D. C.	Horse-power.	1	Feet.	\$46,697.83	\$1,202.66	\$1,000.00	Kilowatt-hour.	6,635	\$0.18	\$0.0053
	Ballantine	do	125	2	31	73,833.32	2,992.91	2,315.00	.....	10,200	.....	.....
	Ballantine auxiliary	G. E. D. C.	600	45	45	71,153.58	2,901.71	2,510.00	.....	1,870	1.55	.0845
	A-4 Raise	Scoop wheel	25	3.5	3.5	3,328.43	.....	249.63	.....	31,050	.....	.....
	Pumping station No. 1	V. M. D. C.	2,760	5	28.2	188,020.08	.....	.....	.....	186,283	.....	.....
Minidoka	Pumping station No. 2	do	2,400	4	30.8	184,920.94	.....	.....	.....	187,268	.....	.....
	Pumping station No. 3	do	1,560	3	29.9	103,108.58	.....	.....	.....	153,805	.....	.....
	Boerssch Lake	do	200	2	19.8	32,847.72	.....	.....	.....	92,823	.....	.....
	C-2 pumping station	Scoop wheel	10	1	2.5	5,008.15	.....	.....	.....	400,160	.....	.....
	C-14 pumping station	H. M. D. C.	7.5	1	7	2,803.97	.....	.....	.....	15,280	.....	.....
North Dakota Pumping <sup>2</sup>	1812 pumping station	do	5	1	4	1,008.76	.....	.....	.....	4,623	.....	.....
	West End pumping station	Scoop wheel	10	1	4.8	3,634.71	.....	.....	.....	5,190	.....	.....
	H. M. D. C.	.....	150	2	21.25	18,745.61	.....	.....	.....	387,625	.....	.....
	Pumping station No. 1	S. T. D. C.	450	2	56	8,821.00	.....	.....	.....	1,004	.....	.....
	Pumping station No. 2	H. M. D. C.	176	2	26.6	14,065.00	.....	.....	.....	98,300	.....	.....
North Platte	Pumping station No. 3	do	405	3	12-32	39,647.00	.....	.....	.....	2,386	.....	.....
	Pumping station No. 4	do	100	1	25-27	8,821.00	.....	.....	.....	628	.....	.....
	Dutch Flat Drain No. 1	V. M. D. C.	30	1	41	33,747.83	.....	.....	.....	58,980	.....	.....
	Dutch Flat Drain No. 2	do	20	1	30	.....	.....	.....	.....	1,235	.....	.....
	Dutch Flat Drain No. 3	do	20	1	49	.....	.....	.....	.....	5,41	.....	.....
Okanogan	Duck Lake (old)	G. E. D. C.	125	1	55	10,858.21	.....	.....	.....	.....	.....	.....
	Duck Lake (new)	M. D. C.	50	1	55	13,961.24	.....	.....	.....	370	.....	.....
	Government wells Nos. 1 and 2	V. M. D. C.	30	2	av. 35	18,598.21	.....	.....	.....	10,653	.....	.....
	Robinson Flat	H. M. D. C.	200	2	198	30,077.24	.....	.....	.....	871,967	.....	.....
	Salmon Lake	G. E. D. C.	150	1	av. 10	17,842.16	.....	.....	.....	808	.....	.....
Salt River	Salmon Lake	10 V. M. D. C.	75 and 35	11	av. 33.56	148,084.21	.....	.....	.....	17,451	.....	.....
	Chandler division	1 H. M. D. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hightline pumping plant	H. M. D. C.	3-250	4	47	91,033.90	.....	.....	.....	2,880,618	.....	.....
	Mesa division	1-150	1-75	.....	.....	.....	.....	.....	.....	83,927	.....	.....
	Phoenix division	15-35	10,20	16	20.73	145,047.84	.....	.....	.....	837,578	.....	.....
Salt River division	do	25-35	25,35	14	54.57	111,578.39	.....	.....	.....	12,472	.....	.....
	do	.....	.....	.....	.....	.....	.....	.....	.....	1,690,406	.....	.....
	San Francisco	H. M. D. C.	100	21	av. 29.61	169,318.26	.....	.....	.....	862,658	.....	.....
	do	.....	35	1	30	29,973.98	.....	.....	.....	24,323	.....	.....
	Tollison division	V. M. D. C.	25 and 3	21	av. 28.42	168,360.75	.....	.....	.....	1,811,288	.....	.....

Grand View	(N. E. D. C.)	17 1/2	5	7 1/2	75,000.00	(17 1/2)	1,120.00	11,040	
Yuma.....	V. T. D. C.	36	1	100	5,000.00	300.00	300.00	400	.0073
	V. T. D. C.	800	2	110	162.00	200.00	45.00		.75
	V. T. D. C.	800	2	110	92,000.00	2,700.01	2,450.00	16,030	.0084
	V. T. D. C.	190	1	105	31,968.00	1,117.82	1,800.00	3,304	.0083
	V. T. D. C.	550	2	200	48,500.00	1,940.00	1,800.00	3,511.6	.0015
	V. T. D. C.	180	1	90	28,000.00	1,351.63	1,500.00	3,072	.0041
	V. T. D. C.	700	1	80	147,453.40				.365
	V. T. D. C.	200	1		6,775.60	2,753.28	300.00	2,000	1.88
	V. T. D. C.	110	2	5.6	130,751.12	14,737.23	1,037.00	31,900	.046
	V. T. D. C.	175	2	av. 10	900.00	618.19	68.00	102.5	.814
	V. T. D. C.	40	1	7					

1 Type V. M. D. C. - Vertical motor-driven centrifugal pump. H. M. D. C. - Horizontal motor-driven centrifugal pump. S. T. D. C. - Steam turbine-driven centrifugal pump.  
 V. T. D. C. - Vertical hydraulic turbine-driven centrifugal pump. H. T. D. C. - Horizontal hydraulic turbine-driven centrifugal pump. G. E. D. C. - Gas-engine-driven centrifugal pump.  
 G. E. D. C. - Gas-engine-driven screw pump.

2 Operated by Minidoka Irrigation district.

3 Total for 3 South Side stations.

4 Average for 3 stations.

5 Total 7 North Side stations.

6 For irrigation season 1921.

7 Present equipment installed spring of 1922.

8 125-horsepower motor being brought from Duck Lake.

9 Operated by Grand View Irrigation district.

10 Not available.

11 Operated by Snipes Mountain Irrigation district.

12 Operated by Irrigation district.

13 Cost data of doubtful value.

14 Operated by Prosser Irrigation district.

15 Operated May and June.

### ORGANIZATION AND PERSONNEL.

The Federal reclamation law places in the Secretary of the Interior the authority and responsibility for the reclamation work. As the instrument for the execution of such work the Secretary has organized the Reclamation Service, headed by the director, who, with the assistant director, has headquarters at Washington, and who frequently travels to the projects and proposed works in the field. A subordinate headquarters office is maintained at Denver in charge of the chief engineer, who, with two assistant chief engineers, has more immediate contact with all the field work. In the Washington office are conducted those operations that are necessary in dealing with the Secretary, Congress, the Treasury Department, and other Federal agencies, as well as those involving general direction and administration of the work.

At Denver there is a force of technical men for the design of the principal engineering structures, including work of an electrical nature. That is the headquarters point for extensive purchases, and the chief engineer and two assistants alternate in charge of the office and traveling from one project to another to maintain close administration and give prompt advice and decision on engineering and other details.

Each project is in administrative charge of a project manager. The project force includes the necessary engineers, clerical help, and operatives such as gate tenders, ditch riders, and water masters for the work of constructing, operating, and maintaining the irrigation systems, with sufficient common and skilled labor for the work in hand.

The legal work of the Reclamation Service both in the Washington office and in the field is in charge of the chief counsel. There are eight main field offices of the legal division, located, respectively, at Denver, Colo.; Montrose, Colo.; Mitchell, Nebr.; Helena, Mont.; Boise, Idaho; Portland, Oreg.; San Francisco, Calif.; and El Paso, Tex.; and two legal suboffices located, respectively, at American Falls, Idaho, and Las Cruces, N. Mex. The attorneys in charge of these offices are the legal advisers to the various project managers located within their respective districts. In the central Denver office is located a district counsel who is legal adviser to the chief engineer.

On June 30, 1922, the force of the Reclamation Service comprised 3,667 persons, subdivided as follows: Educational, 499; noneducational, 1,080; laborers, 2,088. In addition, the employees of contractors working on reclamation projects numbered 231.

# PURCHASES.

*Purchases of materials and supplies, 1910-1922.*

Fiscal year.	Number of purchases.	Gross amount.	Discount.
1910.....	1,774	\$504,023.60	.....
1911.....	1,607	574,323.74	.....
1912.....	2,205	930,018.53	.....
1913.....	2,735	459,890.17	\$1,286.29
1914.....	3,116	471,446.28	4,604.28
1915.....	2,854	454,661.46	3,842.09
1916.....	5,019	680,601.99	6,747.38
1917.....	4,989	1,095,830.36	13,000.25
1918.....	6,215	1,809,580.84	17,876.29
1919.....	6,038	1,489,583.04	8,727.12
1920.....	3,868	948,270.46	9,523.42
1921.....	6,599	2,314,782.36	18,383.04
1922.....	5,892	1,678,919.00	17,153.70
<b>Total.....</b>	<b>52,041</b>	<b>13,411,931.83</b>	<b>104,143.86</b>

# TRANSPORTATION.

*Freight and express data.*

Fiscal year.	Bills settled.	Commercial charges.	Deducted account of contracts, land grants, and other causes.	
			Total.	Per cent.
1907.....	\$278,782.10	\$470,863.26	\$192,081.16	40.8
1908.....	369,583.04	577,803.42	208,247.38	36.0
1909.....	778,047.12	1,403,970.10	625,922.98	44.5
1910.....	437,032.61	758,808.76	321,776.15	42.4
1911.....	406,360.65	666,876.59	261,516.04	39.2
1912.....	610,740.23	1,055,733.27	444,993.04	42.1
1913.....	481,118.91	887,077.59	355,958.68	42.5
1914.....	547,705.99	927,163.49	379,457.50	40.9
1915.....	778,893.33	1,393,347.96	614,454.63	44.1
1916.....	471,606.52	817,481.33	345,874.81	42.3
1917.....	393,477.70	653,013.98	259,536.28	39.7
1918.....	824,562.28	606,479.68	283,917.35	46.6
1919.....	331,056.20	531,580.94	203,524.74	38.1
1920.....	267,308.53	482,101.12	184,797.59	41.9
1921.....	359,499.56	599,730.66	240,231.10	40.0
1922.....	411,817.80	737,481.39	325,662.59	44.2
<b>Total.....</b>	<b>7,246,587.47</b>	<b>12,494,540.49</b>	<b>5,247,952.02</b>	<b>42.3</b>

**FINANCES.****APPROPRIATIONS.**

The act of June 17, 1902 (32 Stat., 388), commonly known as "The reclamation act," created in the United States Treasury a special fund, known as "The reclamation fund." The accretions to this fund were, in the beginning, altogether from the sale of public lands and fees and commissions. Under the act of February 25, 1920 (41 Stats. 437), the fund was augmented by a certain percentage of the royalties received by the United States on account of potassium and oil leases. These additional accretions, together with the amounts returned by the water users and others and thus made available for reexpenditure, have to a considerable extent offset the decline in the proceeds from the sale of public lands.

Annually Congress authorizes expenditures from the fund for each irrigation project. These appropriations, which are in fact only authorizations, are based upon estimates of the amounts that will accrue to the fund during the year from the sources mentioned. The operations of the service are thus subject to two limitations; first, the available money in the reclamation fund and, second, the expenditure of a maximum amount on a particular project. The appropriation act, however, is usually somewhat elastic in that it permits an interchange of not to exceed 10 per cent between projects, the reexpenditure of certain miscellaneous collections, and in some instances the privilege of carrying over unexpended balances from previous years.

It will be seen from the foregoing that even after appropriations or authorizations have been made by Congress a definite program can not be outlined for the fiscal year. There must first be a careful review of the probable funds available in the light of the most recent data. There is more or less uncertainty as to the income from sale of public lands, oil, and potassium leases as well as repayments by water users. Allotments are therefore made for only a portion of the year based upon what can with reasonable certainty be expected to reach the reclamation fund.

These allotments must not only be limited as described but they must be made to come within the congressional authorizations. To control the situation a set of accounts is maintained, using as a basis for each project the amount specified in the appropriation act, adding thereto the miscellaneous collections, etc., and charging against the totals the expenditures and liabilities.

Following is a statement showing status of the appropriations or authorizations for the fiscal year 1922:

for the fiscal year 1922, showing increases and decreases authorized, liabilities and expenditures, and balances unencumbered.

Project.	Appropriation act.	Unexpended appropriations previous year.	Special appropriations.	Collections and transfers.	Total authorized.	Liabilities.	Expenditures.	Total liabilities and expenditures.	Balance of appropriation.
Salt River.....	\$1,000.00				\$1,000.00				
Yuma.....	415,000.00		\$13,067.14	\$68,595.99	496,663.13	\$67,053.28	\$367,077.43	\$424,130.71	
Orland.....	117,000.00		3,151.39	4,533.96	125,735.35	3,812.08	70,401.97	74,213.05	
Grand Valley.....	377,000.00		5,146.05	49,621.88	431,767.93	7,279.32	143,597.80	150,877.12	
Uncompahgre.....	214,000.00		12,300.29	137,202.47	363,402.76	11,164.81	344,940.02	356,104.83	
Rocky Mountain.....	1,570,000.00	\$128,662.10	70,307.24	54,149.00	1,823,108.44	18,343.90	344,940.02	363,284.01	
Klamath.....	1,300,000.00		17,484.69	32,323.18	1,349,807.87	15,830.66	284,331.22	300,161.88	
Minutemen.....	1,725,000.00	602,471.61	17,725.19	167,818.23	2,525,015.03	19,868.90	316,094.62	303,963.52	
Hamden.....	1,198,000.00		12,235.31	9,637.51	1,219,872.82	7,016.71	45,371.82	52,388.53	
Milk River.....	979,000.00		11,340.11	34,814.99	1,025,155.10	72,532.95	228,123.84	300,656.79	
Milk River (St. Mary Storage).....	38,000.00		2,165.63	13,556.75	53,712.38	1,507.74	31,436.51	32,944.25	
Sun River.....	687,000.00		5,460.11	14,040.61	706,500.72	10,704.90	109,161.45	119,866.35	
Lower Yellowstone.....	687,000.00		16,827.87	4,131.42	707,959.29	72,487.51	188,088.27	261,123.78	
North Platte.....	2,115,000.00		30,760.94	127,886.37	2,273,647.31	118,561.31	1,219,482.44	1,385,063.75	
Newlands.....	1,498,000.00		11,203.86	33,581.71	1,542,785.57	38,001.30	302,794.95	340,796.25	
Carlsbad.....	1,900,000.00		2,945.87	7,526.11	1,910,472.98	4,001.19	49,005.23	53,006.42	
Rio Grande.....	1,900,000.00		35,448.90	74,121.47	2,009,570.37	83,379.19	783,791.59	867,170.78	
North Dakota pumping.....	1,115,000.00		2,663.24	56,322.76	1,173,985.00	3,747.15	65,944.92	69,692.07	
Deschutes.....	400,000.00		40.78	15	400,040.93		8,351.84	8,351.84	
Umatilla.....	467,000.00		4,783.34	6,969.32	478,752.66	3,371.62	132,665.55	136,037.17	
Klamath.....	1,213,000.00		8,226.21	30,036.83	1,251,263.04	33,359.27	347,330.26	380,689.53	
Belle Fourche.....	485,000.00		43,003.42	5,361.60	533,365.02	4,094.95	122,755.34	126,850.29	
Strawberry Valley.....	144,000.00		3,802.37	38,965.00	196,767.37	2,019.20	98,031.78	100,051.98	
Okanogan.....	33,000.00	441,107.36	3,251.29	14,725.86	462,084.51	16,406.51	98,380.85	114,787.36	
Yavapai.....	2,100,000.00		30,116.06	68,376.98	2,198,493.04	95,056.00	1,030,574.21	1,225,069.21	
Riverton.....	850,000.00		4,922.22	2,072.27	856,994.49	33,455.28	363,016.77	396,072.05	
Shoshone.....	1,784,000.00		17,190.58	11,388.84	1,812,540.40	104,490.80	757,903.38	860,444.02	
Secondary.....	1,100,000.00	22,256.83	5,861.84	190,976.63	1,319,095.30	20,202.17	208,226.93	228,428.10	
	20,266,000.00	1,194,490.90	372,351.02	1,269,074.47	23,091,916.39	828,158.69	7,850,441.73	8,678,600.42	
INDIAN PROJECTS.									
Flathead.....	200,000.00		9,899.23	39,270.71	479,426.92	35,548.52	194,589.15	230,147.67	\$197,276.15
Blackfoot.....	24,000.00		2,025.07	12,766.54	38,791.61	8,170.67	30,620.94	38,791.61	
Fort Peck.....	20,000.00		1,009.54	11,660.64	32,670.18	2,266.19	20,602.74	20,602.74	11,771.25
	244,000.00	178,256.83	12,933.84	63,697.89	408,888.61	44,015.38	245,822.88	289,838.21	209,050.40

<sup>1</sup> Includes judgments of Court of Claims and increase of compensation.

NOTE.—Cash on hand with United States Treasurer and special fiscal agents on projects, \$4,302,894.53.



The purpose of the foregoing is merely to set forth the fact that the expenditures and liabilities have not exceeded the authorizations. The balance of authorizations over expenditures and liabilities amounting to \$14,413,315.97 is due to the fact that the accretions to the reclamation fund were much less during the year than the estimate upon which the authorizations were based. The available cash balance with the United States Treasurer and special fiscal agents on June 30, was \$4,302,884.53, which is \$3,254,175.74 in excess of current and deferred liabilities, not including the \$18,000,000 unpaid balance of the \$20,000,000 advance from the General Treasury, which is known as the bond loan.

The following is a statement of available funds during the fiscal year 1922, not including the appropriations for Indian projects, showing also the expenditures and the balance on hand July 1, 1923:

<b>Reclamation fund:</b>		
Balance on hand July 1, 1921.....	\$4,065,873.30	
Less: Adjustment.....	238,497.27	\$3,827,376.03
Proceeds from sale of public lands.....		1,775,500.80
Proceeds from sale of town lots.....		18,645.06
Oil leasing royalties.....		3,426,633.84
Potassium leasing royalties.....		165.88
Proceeds from Federal power leases.....		106.31
Project collections.....		4,294,577.34
Total reclamation fund.....		13,342,935.26
<b>Special:</b>		
Judgments, Court of Claims.....		100,228.93
Increase of compensation (net).....		327,572.56
Grand total.....		13,770,736.77
<b>Expenditures:</b>		
Repayment bond loan.....	\$1,000,000.00	
Reclamation fund.....	8,040,050.75	
Judgments, Court of Claims.....	100,228.93	
Increase of compensation (net).....	327,572.56	9,467,852.24
Balance on hand July 1, 1922, reclamation fund.....		4,302,884.53
<b>Yuma auxiliary:</b>		
Balance on hand July 1, 1921.....	\$265,842.56	
Proceeds from sale of lands.....	18,691.55	
Project collections.....	133,199.13	
Total, auxiliary fund.....		417,733.24
Increase of compensation (net).....		3,319.82
Total.....		421,053.06
<b>Expenditures:</b>		
Auxiliary fund.....	\$268,940.84	
Increase of compensation.....	3,319.82	292,260.66
Balance on hand July 1, 1922.....		128,792.40
<b>Drainage and outover:</b>		
Balance on hand July 1, 1921.....	\$206.93	
Deficiency appropriation.....	21.01	226.94
Expenditures.....		21.01
Balance on hand July 1, 1922 (to lapse).....		205.93

*Proceeds from the sale of public lands and town sites, by States.*

	Sales of public lands.		Sale of reclamation townsites.		Totals.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Arizona.....	\$96,417.68	\$1,997,714.22			\$96,417.68	\$1,997,714.22
California.....	156,238.21	7,123,840.13			156,238.21	7,123,840.13
Colorado.....	227,234.51	9,430,339.89			227,234.51	9,430,339.89
Idaho.....	112,615.38	6,558,635.82	\$1,303.66	\$175,766.69	113,919.04	6,734,302.51
Kansas.....	11,064.66	1,034,186.63			11,064.66	1,034,186.63
Montana.....	293,884.12	14,471,113.46	1,294.77	119,789.93	295,178.89	14,590,903.39
Nebraska.....	7,886.19	2,076,321.65			7,886.19	2,076,321.65
Nevada.....	33,383.50	863,682.01			33,383.50	863,682.01
New Mexico.....	168,016.06	5,517,342.49			168,016.06	5,517,342.49
North Dakota.....	510.81	12,211,646.52			510.81	12,211,646.52
Oklahoma.....	2,457.59	5,927,186.13			2,457.59	5,927,186.13
Oregon.....	96,242.52	11,540,682.94			96,242.52	11,540,682.94
South Dakota.....	39,737.99	7,656,527.88	142.05	74,330.22	39,880.04	7,730,858.10
Utah.....	167,323.94	3,396,917.36			167,323.94	3,396,917.36
Washington.....	30,551.46	7,233,577.30			30,551.46	7,233,577.30
Wyoming.....	343,865.41	7,280,623.13	17,266.08	198,476.80	361,131.49	7,479,099.93
Adjustment.....			11,361.48		11,361.48	
Total.....	1,775,500.80	104,320,249.56	18,645.08	568,363.64	1,794,145.88	104,888,613.20

<sup>1</sup> Contra.

## ASSETS, LIABILITIES, AND CAPITAL.

The financial statement following this narrative includes what are for convenience termed "Reclamation fund projects," or those projects which are being constructed primarily from the reclamation fund. The Riverton (formerly called Wind River) project is classed with the above as it is now subject to the reclamation act. The statement excludes the Mesa division of the Yuma project, the expenditures in connection with the drainage and cut-over investigations and the Indian projects being constructed for the office of Indian Affairs.

The funds that have been made available for the construction of reclamation fund projects to date are as follows:

Reclamation fund proper.....	\$112,707,411.56
Judgments, Court of Claims.....	550,347.58
Increase of compensation (net).....	2,181,064.95
Rio Grande Dam.....	1,000,000.00
Ceded lands, Wind River (Riverton).....	\$830,432.41
Increase of compensation.....	17,71.73
	377,194.14
Total capital.....	116,126,631.23
Advance to reclamation fund (bond loan), not reimbursed.....	18,000,000.00
Total.....	134,82,038.23
Less cash on hand, including Wind River for \$1,226.87.....	4,304,110.40
	130,521,927.13
Plus: Reexpenditure of capital (collections).....	41,351,434.94
Gross expenditure.....	171,873,362.77

*Capital, nonreimbursable.*—The appropriation of \$1,000,000 for the Rio Grande Dam is not reimbursable, but is included in the construction cost of the Rio Grande project and then subtracted so as to reduce the asset—construction cost of project—to a reimbursable basis. Likewise it is subtracted from the capital account as a non-reimbursable capital investment.

*Capital, temporary impairment.*—The reclamation act and acts amendatory thereof or supplementary thereto contemplate the repayment of only the actual cost. Such a limitation inevitably results in more or less expenditures which may in the end not be reimbursed. Such, for example, are expenditures in connection with secondary project investigations and projects which have been completed or partly completed and then discontinued. Some expenditures of this character have been made and are here treated as temporary impairment of the capital, although it is not altogether improbable that changing conditions incident to the development of the work of reclaiming lands will provide a means of reimbursement. This is especially true of secondary project investigations, as the United States will be reimbursed in the event of the adoption and construction of irrigation projects for which the investigations were made.

The expenditures in connection with discontinued projects and in one or two cases where, by contracts, the water users have been relieved of the responsibility of repaying certain items are included in the construction cost asset and then subtracted to arrive at the probable reimbursable value.

There is also an item of operation and maintenance cost carried as an impairment of the capital, due to the discontinuance of one division of a project and no provision made in a contract with the water users for repayment of a portion of the cost in connection with another division.

The temporary impairment, exclusive of secondary project investigations, amounts to \$1,933,706 or about 1.4 per cent of the funds made available for reclamation fund projects. The amount invested in secondary project investigations will be reimbursed in the event of the adoption and construction of irrigation projects.

Reserves include the revenues on account of leases of grazing lands, penalties, and forfeitures in connection with construction repayment accounts, etc., which are not considered creditable to the projects, and are therefore in the consolidated financial statement set over against the capital impairment.

Liabilities include some contingent items, current obligations, and the unpaid balance of the loan of \$20,000,000 to the reclamation fund by the General Treasury, which is being repaid at the rate of \$1,000,000 per annum, \$2,000,000 having been returned at the close of the fiscal year.

Assets include the unexpended balance of the reclamation fund, value of materials, supplies, equipment, and plant on hand, current and deferred accounts receivable, prepaid value of civil service retirement fund transfers, the cost value of irrigation works, etc. The latter is reduced by the cost of discontinued projects, the non-reimbursable value of the Rio Grande project as previously explained, and by the value of water right contracts. These contracts change the form of the asset, first to a deferred accounts receivable, then to a current account, and lastly to cash when paid.

The receivable accounts include, in addition to the current and deferred portions of the water-right construction contracts, the unpaid portion of the cost of operation and maintenance. Part of the operation and maintenance cost is covered by current bills; some is deferred under contracts; a portion represents deficits during previous years; and the balance is current year cost. The deficits are gradually being absorbed by increased assessments, and the current year cost will be billed at the close of the season in accordance with public notices.

*Statement of assets, liabilities, and capital, reclamation fund projects, as of June 30, 1922.*

	Balances.	Subtotals.	Totals.
<b>Assets:</b>			
<b>Cash—</b>			
With Treasurer United States, reclamation fund.	\$3,699,225.20		
With Treasurer United States, unadjusted.....	11.62		
With special fiscal agents, reclamation fund.....	603,647.71	\$4,302,884.53	
With Treasurer United States, ceded lands, Wind River (Riverton).....	1,067.87		
With Treasurer, United States, unadjusted, Wind River (Riverton).....	158.00		
		1,226.87	
With project employees, including special deposits.....	27,362.33	27,362.33	
Inventories, lumber, steel, cement, forage, fuel, etc.	989,807.50		\$4,331,472.73
Plant and equipment, original value less depreci- ation.....	2,798,453.59		989,807.50
Prepaid civil-service retirement fund.....	1,148.62		2,798,453.59
Accounts receivable (current)—			1,148.62
Uncollected construction water-right charges accrued.....	2,161,517.22	2,161,517.22	
Uncollected operation and maintenance charges accrued.....	2,033,052.26	2,033,052.26	
Uncollected rentals of irrigating water.....	229,959.10	229,959.10	
Uncollected rentals of power and light.....	33,121.54	33,121.54	
Uncollected rentals of grazing and farming lands.	21,725.61	21,725.61	
Uncollected miscellaneous.....	151,940.42	151,940.42	
			4,631,316.15

## Statement of assets, liabilities; and capital, reclamation fund projects, as of June 30, 1922—Continued.

	Balances.	Subtotals.	Totals.
<b>Assets—Continued.</b>			
Accounts receivable (deferred)—			
Construction water-right contracts—unaccrued charges.....	\$82,369,311.14		
Construction water-right charges paid in advance (contra).....	163,525.63	\$82,205,785.51	
Operation and maintenance charges unaccrued—			
Contracted (specific contracts).....	329,417.78		
Charges paid in advance (contra).....	2,580.66	326,837.12	
Not contracted (including net cost Jan. 1 to June 30, 1922).....	1,972,266.30		
Less: Loss.....	249,816.59	1,722,449.71	
Miscellaneous (to be paid from Yuma Auxiliary fund).....		252,000.00	\$84,507,072.34
Undistributed cost of general offices (to be transferred to project costs).....	76,841.87		76,841.87
Irrigation works—			
Gross construction cost.....	138,969,494.63		
Less: Miscellaneous revenues.....	3,906,502.75	135,062,991.88	
Less—			
Discontinued projects, etc.....	1,435,073.20		
Nonreimbursable.....	1,000,000.00		
Contracted returns.....	97,710,074.32	100,145,147.34	34,917,834.54
Investment items in transit.....	10,493.13		10,493.12
<b>Total assets.....</b>			<b>132,264,440.47</b>
<b>Liabilities:</b>			
Current accounts payable; labor, purchases, transportation, etc.....	601,665.25		
Contingent; uncompleted construction contracts, undelivered purchase orders, special cash deposits, etc.....	447,043.64	1,048,708.79	
Less: Contingent asset value of uncompleted contracts, undelivered purchases, etc.....	419,788.82	419,788.82	628,919.97
Deferred; Treasury loan to reclamation fund—			
Amount loaned.....	20,000,000.00		
Less: Amount repaid.....	2,000,000.00	18,000,000.00	18,000,000.00
<b>Capital:</b>			
Reclamation fund—			
Sale of public lands.....	104,320,249.56		
Sale of town-site lots.....	568,363.64		
Proceeds from potassium royalties and rentals.....	14,220.18		
Proceeds from oil-leasing act—			
Past production.....	4,171,479.18		
Current production.....	3,632,992.69		
Proceeds, Federal water-power licenses.....	106.31	112,707,411.56	
Special funds:			
Judgments, Court of Claims.....	550,347.58	550,347.58	
Rio Grande Dam.....	1,000,000.00	1,000,000.00	
Increase of compensation (includes Riverton-Indian).....	2,208,846.68	2,208,846.68	
Ceded lands, Wind River (Riverton).....	359,432.41	359,432.41	
<b>Total capital fund.....</b>		<b>116,826,088.23</b>	
Less—			
Temporary impairment of capital—			
Secondary project investigations.....	1,748,479.16		
Less: Funds advanced.....	406,135.62		
Discontinued projects, etc., construction.....	1,342,343.54		
Operation and maintenance.....	1,435,073.02		
	249,816.59		
Less: Reserves; rentals of lands, forfeitures, etc.....	3,027,233.15		
	836,715.42		
Nonreimbursable, Rio Grande Dam.....	2,190,517.73	3,190,517.73	113,635,537.50
	1,000,000.00		
<b>Total liabilities and unimpaired capital.....</b>			<b>132,264,440.47</b>

## CONSTRUCTION COSTS.

The following statement summarizes, by projects, the net construction cost, that portion which probably will not be repaid on account of discontinued projects, etc., that which is nonreimbursable, the amounts covered by repayment contracts, and the balance which it is expected will ultimately be contracted as projects or parts of projects are completed and construction charges announced.

By net cost is meant the gross cost, less incidental revenues such as rentals of buildings, etc. These revenues are distinguished from "contracted returns" in that the latter are in the nature of permanent water rights.

Contracted returns include individual water-right applications, agreements with water users' organizations, etc., and the amounts advanced for construction purposes by beneficiaries prior to execution of the work. These contracted returns are made a matter of book-keeping record only when there is a definite basis of entry as to the amount to be returned. Much of the security for the return of the net cost is of such a nature that it can not be reflected in the books. This security consists of large areas of irrigable land, most of which is to a greater or less extent obligated ultimately to repay its proportionate share of the cost. It includes public land withdrawn unentered, public land entered subject to the reclamation act, private land pledged in some manner to repay its proportionate share of the cost, private land not pledged, State land sold or unsold, railroad land, etc. Regardless of the status of these various classes of land, they are arid or semiarid and require water for their full development. Thus, there is a large resource for the repayment of the cost which can not at present be reduced to dollars and cents and be shown in a financial statement.

Most of the contracts for the return of the cost of a particular project or division of a project are not executed until the major portion of the work is completed. In some instances, however, notably the King Hill project, the repayment contract precedes the construction cost; hence the excess of contracted returns over net cost to date.

The period of return usually extends over 20 years in accordance with the extension act (Aug. 13, 1914, 38 Stat., 686). There are numerous exceptions to this rule, and the period of repayment may now be running or it may not begin until some future date.

## FINANCES.

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Consolidated statement, by projects, of net construction cost and contracted returns.

State and project.	Net cost.		Discontinued projects, etc.	Nonreimbursable.	Contracted returns.		Balance.
	Fiscal year 1922.	To June 30, 1922.			Fiscal year 1922.	To June 30, 1922.	
Arizona:							
Salt River.....		\$10,548,119.28	1,8382,014.17		\$83.14	\$10,106,105.11	*\$83.14
Arizona-California:							
Yuma.....	*\$109,541.59	8,942,183.14			*162,585.60	5,712,466.42	*\$3,975.99
California:							
Orland.....	42,025.78	1,057,059.13			2,668.16	1,064,153.48	39,357.62
Colorado:							
Grand Valley.....	34,017.28	3,765,193.61				156.63	34,017.28
Uncompahgre.....	32,443.97	6,067,183.45	*47,870.81		6,713,584.50	6,713,584.50	*\$3,631,140.53
Idaho:							
Boise.....	21,378.12	12,625,780.97			280,112.81	12,345,900.50	99,100.47
King Hill.....	261,178.80	1,471,624.46				2,000,000.00	*\$28,375.54
Mindoka.....	63,831.29	6,846,236.87			*\$65.25	6,916,017.86	*\$69,777.99
Kansas:							
Garden City.....		385,651.07	*332,621.77		54.89	83,123.30	*\$4.89
Montana:							
Huntley.....	18,243.41	1,467,685.13			*8,208.30	1,324,988.08	26,456.71
Lower Yellowstone.....	694,425.17	3,566,405.65				3,614,104.21	694,425.17
Milk River.....	308,291.15	6,559,894.31				308,291.15	6,559,894.31
Sun River.....	106,490.41	4,087,836.78			2,712.00	427,697.84	100,778.41
Nebraska-Wyoming:							
North Platte.....	1,294,760.21	12,962,323.94			1,822,980.77	8,849,803.65	*\$28,220.56
Nevada:							
Newlands.....	191,845.04	6,691,414.52			669,642.48	2,692,614.01	*\$77,794.44
New Mexico:							
Carlsbad.....	*1,507.33	1,397,308.65				1,417,481.06	*1,507.33
Hondo.....		371,867.17	*371,867.17				
New Mexico-Texas:							
Rio Grande.....	794,033.27	11,315,248.98			5,000.00	7,655,000.00	789,033.27
North Dakota:							
North Dakota pumping.....	*\$29.88	684,798.83	*301,299.10			290,803.74	*\$29.88
Oregon:							
Umatilla.....	221,222.79	2,798,885.14			1,012,208.02	2,687,104.49	*\$790,984.23
Oregon-California:							
Klamath.....	409,468.58	3,540,833.84			48,872.15	2,097,296.94	355,096.43

\* Contra.

1 See contract with water users' association dated Sept. 6, 1917.

2 See contract with water users' association dated May 7, 1918.

3 Projects partly or wholly discontinued.

4 Expenditures in connection with the construction of Elephant Butte Dam, Rio Grande project, not reimbursable by water users (34 Stat., 1257).

## Consolidated statement, by projects, of net construction cost and contracted returns—Continued.

State and project.	Net cost.		Discontinued projects, etc.	Nonreimbursable.	Contracted returns.		Balance.	
	Fiscal year 1922.	To June 30, 1922.			Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
South Dakota:								
Belle Fourche.....	\$35,623.36	\$3,568,689.69	.....	.....	\$1,215.06	\$2,617,847.09	\$84,413.30	\$950,842.60
Utah:								
Strawberry Valley.....	*8,365.16	3,472,461.80	.....	.....	7,170.00	3,082,999.37	*15,535.16	389,462.43
Washington:								
Oranogan.....	192,538.48	1,398,057.67	.....	.....	200,000.00	1,508,008.29	*37,441.52	*104,945.02
Yakima.....	649,249.00	11,065,460.84	.....	.....	58,453.89	9,566,968.69	590,813.11	1,408,494.15
Wyoming:								
Riverton.....	308,634.69	634,407.64	.....	.....	.....	.....	308,634.69	634,407.64
Shoshone.....	763,663.68	7,479,857.32	.....	.....	318,680.24	4,900,204.06	460,063.44	2,579,663.26
Total.....	6,247,204.32	135,062,961.88	\$1,435,073.02	\$1,000,000.00	10,966,130.96	97,710,074.82	*4,718,928.44	34,917,894.54

\* Contra.

## OPERATION AND MAINTENANCE COSTS.

The following statement summarizes, by projects, the net cost, the contracted returns, and the balance not contracted for the calendar year 1921 and the total to December 31, 1921.

Similar to the construction statement the net cost represents the gross cost less incidental revenues, or those returns which are not for water deliveries.

The contracted returns include all definite contracts for the return of the net cost, regardless of the terms of payment. Some has been billed and paid, some is represented by unpaid bills, and some is covered by contracts providing for payment at some future date.

The "balance" is that part of the cost which is not at present covered by bills or definite repayment contracts. The items starred indicate contracted returns in excess of net cost. The balance is carried to the consolidated balance sheet as a part of the unaccrued operation and maintenance accounts receivable.

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*Consolidated statement, by projects, of net operation and maintenance cost and contracted returns, by calendar years.*

State and project.	Net cost.		Loss.	Contracted returns.		Balance.	
	Calendar year 1921.	To Dec. 31, 1921.		Calendar year 1921.	To Dec. 31, 1921.	Calendar year 1921.	To Dec. 31, 1921.
Arizona-California:							
Yuma.....	\$330,742.06	\$1,276,629.68	.....	\$260,627.18	\$882,163.30	\$70,114.90	\$394,466.38
California:							
Orland.....	37,596.48	165,191.22	.....	39,491.06	164,673.17	*1,894.57	518.05
Idaho:							
Boise.....	327,437.27	1,180,464.68	.....	328,712.64	1,180,428.29	724.63	36.39
Minidoka.....	144,863.25	1,206,570.34	.....	150,748.21	1,222,860.31	*5,864.96	*26,289.97
Montana:							
Huntley.....	58,299.43	799,976.64	.....	67,222.88	377,182.99	*8,923.45	412,823.65
Sun River.....	17,510.77	177,667.60	.....	26,516.64	145,326.85	*9,006.87	29,346.75
Montana-North Dakota:							
Lower Yellowstone.....	*467,914.14	291,955.27	.....	32,414.39	286,521.09	*600,328.53	*1,565.82
Nebraska-Wyoming:							
North Platte.....	262,066.95	1,430,661.96	.....	178,020.88	1,559,898.20	84,076.07	*129,236.24
Nevada:							
Newlands.....	106,501.12	856,625.54	.....	121,022.47	682,709.00	*14,521.35	173,916.54
New Mexico:							
Carlsbad.....	45,452.10	405,103.30	.....	58,291.14	396,769.43	*12,839.04	8,333.87
New Mexico-Texas:							
Rio Grande.....	233,754.42	233,754.42	.....	230,019.98	280,019.98	3,734.44	3,734.44
North Dakota:							
North Dakota pumping.....	32,137.46	385,573.02	1 \$249,816.59	32,137.46	145,756.43	.....	.....
Oregon:							
Umatilla.....	45,709.76	290,782.91	.....	52,205.39	298,318.77	*8,496.61	*7,535.86
Oregon-California:							
Klamath.....	65,380.20	502,722.91	.....	73,674.28	512,743.51	*8,294.06	*10,020.60
South Dakota:							
Belle Fourche.....	129,322.92	896,792.03	.....	147,073.96	774,433.89	*17,761.04	92,358.14
Utah:							
Strawberry Valley.....	134,369.69	301,575.14	.....	61,814.15	210,104.02	72,565.54	91,381.12
Washington:							
Okanogan.....	60,389.63	305,506.28	.....	47,559.94	206,964.99	12,899.69	96,551.29
Yakima.....	223,765.88	1,873,320.40	.....	298,168.64	1,888,136.47	*74,612.76	*9,818.07
Wyoming:							
Shoshone.....	81,869.29	527,926.30	.....	120,488.33	532,974.81	*38,619.04	*5,048.51
Total.....	1,867,314.53	13,078,799.64	249,816.59	2,324,269.61	11,713,087.50	*456,895.03	1,115,945.55

\* Contra.

1 Includes deficit on Buford-Tremonton division and on Williston division prior to Apr. 1, 1919.

## REPAYMENTS AND MISCELLANEOUS RETURNS.

During the fiscal year 1922 there was returned to the reclamation fund by the water users and others a total of \$4,294,507.34, making a turnover to date of \$41,350,449.48, including \$2,997,829.24 returned by the Office of Indian Affairs on account of previous expenditures from reclamation fund in connection with Indian projects.

These returns are classified as repayment of net construction cost; repayment of net operation and maintenance cost; and miscellaneous.

Miscellaneous includes the collections on account of temporary rentals of various kinds, sales of materials, supplies, meals, mercantile stock, etc.

The following is a summarization of the collections for the year and to date, creditable to the reclamation fund:

	Fiscal year 1922.	To June 30, 1922.
Repayments, net construction cost.....	\$1,410,364.87	\$12,933,434.47
Repayments, net operation and maintenance cost.....	1,641,428.56	9,456,875.43
Miscellaneous:		
Water rentals.....	380,760.99	6,890,487.42
Power and light.....	239,615.26	2,250,715.86
Reimbursement from Indian officer, Indian projects.....		2,997,829.24
Other miscellaneous.....	622,337.66	6,812,107.06
Total.....	4,294,507.34	41,350,449.48

The outstanding current accounts receivable as of June 30, 1922, total \$4,631,316.15, summarized as follows:

Construction repayments.....	\$2,161,517.22
Operation and maintenance repayments.....	2,033,062.26
Water rentals.....	229,969.10
Power and light.....	33,121.54
Grazing and farming lands.....	21,785.61
Miscellaneous.....	151,940.42
Total.....	4,631,316.15

The following statements give the status of the accrued charges in connection with construction and operation and maintenance repayments, and water rentals; also the balance of uncollected charges for power and light, grazing and farming lands, and miscellaneous:

*Construction repayments (including funds advanced for construction).*

State and project.	Due.		Collected.		Other credits to June 30, 1922.	Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.			
			Fiscal year 1922.	To June 30, 1922.		
Arizona:						
Salt River.....	\$406,724.02	\$1,220,005.78	\$838.95	\$610,800.27	.....	\$809,205.51
Arizona-California:						
Yuma.....	141,350.62	986,766.96	110,880.94	926,883.52	\$951.26	58,932.18
California:						
Orland.....	44,735.79	169,284.65	44,735.79	169,284.65	.....	.....
Colorado:						
Grand Valley.....	.....	156.63	.....	156.63	.....	.....
Uncompahgre.....	933.80	933.80	933.80	933.80	.....	.....
Idaho:						
Boise.....	379,026.78	1,307,579.18	215,272.42	1,086,746.04	25,092.00	195,741.14
King Hill.....	76,752.20	76,752.20	.....	.....	.....	76,752.20
Minidoka.....	271,881.91	2,570,581.91	218,128.01	2,231,118.28	153,706.69	185,756.84
Kansas:						
Garden City.....	839.89	53,129.30	504.89	152,794.30	.....	335.00
Montana:						
Huntley.....	26,000.11	367,118.43	13,937.96	345,307.45	339.40	21,471.58
Sun River.....	11,746.44	148,793.34	5,942.24	135,968.49	.....	12,929.85
Montana-North Dakota:						
Lower Yellowstone.....	.....	41,135.10	.....	41,135.10	.....	.....
Nebraska-Wyoming:						
North Platte.....	358,851.72	1,981,683.42	192,347.60	1,534,240.66	33,816.79	413,625.97
Nevada:						
Newlands.....	40,181.40	506,570.37	31,162.50	482,654.41	5,447.40	18,468.56
New Mexico:						
Carlsbad.....	55,428.29	372,368.87	49,562.71	330,490.14	.....	41,878.73
New Mexico-Texas:						
Rio Grande.....	5,000.00	5,000.00	.....	.....	.....	5,000.00
Oregon:						
Umatilla.....	29,226.00	341,490.24	8,101.94	205,015.47	.....	36,474.87
Oregon-California:						
Klamath.....	27,737.23	502,285.70	41,613.58	475,896.73	.....	26,383.97
South Dakota:						
Belle Fourche.....	110,666.19	631,207.56	26,000.00	462,924.77	11.08	168,271.71
Utah:						
Crawberry Valley..	93,099.76	355,824.97	63,484.23	313,669.35	.....	42,135.62
Washington:						
Okanogan.....	9,327.15	50,711.18	6,636.15	41,126.87	.....	9,584.31
Yakima.....	366,626.44	2,965,538.35	339,719.04	2,803,047.79	26,446.87	136,043.69
Wyoming:						
Shoshone.....	99,355.83	685,845.14	40,582.12	583,324.65	.....	102,520.49
Total.....	2,555,510.57	15,240,763.18	1,410,364.87	12,933,434.47	245,811.49	2,161,517.23

<sup>1</sup> From sale of land and plant.

NOTE: Uncollected balance June 30, 1922, 14.1 per cent of total accruals to date.

*Operation and maintenance repayments.*

[Public notice.]

State and project.	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to date.	
			Fiscal year 1922.	To June 30, 1922.		
Arizona-California:						
Yuma.....	\$261,073.72	\$896,377.24	\$167,063.45	\$685,705.95	\$12,539.23	\$198,132.06
California:						
Orland.....	41,544.67	173,237.51	39,375.19	164,562.96	8,564.34	110.21
Idaho:						
Boise.....	355,991.32	1,231,251.93	267,123.86	996,187.02	36,717.73	198,347.18
Boise (drainage)....	154,364.94	201,014.21	48,143.95	67,811.39	2,051.05	131,151.77
Minidoka.....	156,317.12	1,231,856.66	181,146.04	1,016,470.14	66,671.75	148,714.77
Montana:						
Huntley.....	68,523.18	382,275.49	24,394.11	285,970.82	6,689.35	89,615.32
Sun River.....	26,717.77	150,999.67	8,559.86	116,140.32	2,679.07	32,120.28
Montana-North Dakota:						
Lower Yellowstone.....		144,173.15	8,542.42	45,337.42	4.63	98,831.10
Nebraska-Wyoming:						
North Platte.....	207,697.92	1,608,404.04	91,474.26	1,232,806.84	39,352.52	336,244.68
Nevada:						
Newlands.....	123,297.84	694,670.32	88,671.50	598,502.01	19,577.48	76,590.83
New Mexico:						
Carlsbad.....	59,714.73	402,204.85	88,518.52	331,598.13	5,086.81	65,519.91
New Mexico-Texas:						
Rio Grande.....	217,833.61	217,982.63	143,728.11	213,496.19	4,486.44	.....
North Dakota:						
North Dakota Pumping.....	12,766.31	49,627.37	6,894.44	28,913.92	.....	20,713.45
Oregon:						
Umatilla.....	27,391.15	257,855.67	25,258.55	221,099.28	3,277.56	33,478.83
Oregon-California:						
Klamath.....	28,250.34	431,711.09	56,965.46	363,621.50	30,014.15	38,075.44
South Dakota:						
Belle Fourche.....	150,036.78	786,440.46	37,895.38	510,342.75	11,972.78	264,124.93
Utah:						
Strawberry Valley..	70,802.56	224,871.74	51,708.12	193,049.68	6,938.69	24,883.37
Washington:						
Okanogan.....	52,649.62	190,130.96	49,429.80	170,402.06	3,083.56	16,645.34
Yakima.....	285,403.77	1,967,959.74	260,571.87	1,827,865.65	25,660.27	114,433.82
Wyoming:						
Shoshone.....	122,456.36	541,666.43	46,023.67	386,991.40	9,386.06	145,318.97
Total.....	2,422,583.71	11,784,651.16	1,641,428.56	9,456,875.43	294,723.47	2,033,062.26

NOTE.—Uncollected balance June 30, 1922, 17.2 per cent of total accruals to date.

*Operation and maintenance revenues.*

[Water rentals prior to public notice.]

State and project.	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
Arizona:						
Salt River.....		\$2,246,726.01		\$2,246,726.01		
Arizona-California:						
Yuma.....	\$11,799.67	462,761.51	\$12,803.39	460,419.68	\$101.55	\$2,240.28
California:						
Orland.....	229.50	120,154.50	229.50	120,154.50		
Colorado:						
Grand Valley.....	58,890.58	168,828.36	40,050.27	139,774.49	1,137.29	27,916.58
Uncompahgre.....	131,617.52	1,172,244.13	133,034.79	1,083,222.22		89,021.91
Idaho:						
Boise.....	15,160.33	721,247.21	11,193.17	705,410.71	4,720.50	11,116.00
King Hill.....	19,692.71	23,504.49	19,578.79	23,390.57		113.92
Minidoka.....	5,721.80	267,887.04	5,721.80	264,652.81	3,234.23	
Montana:						
Huntley.....	431.99	5,159.27	343.81	5,071.09		88.18
Milk River.....	15,372.67	156,469.19	23,746.65	133,539.63	14.40	22,915.16
Sun River.....	22,102.45	34,887.86	5,861.44	12,665.30	140.75	22,081.81
Montana-North Dakota:						
Lower Yellowstone..	112.16	122,023.08	669.11	119,468.25		2,554.83
Nebraska-Wyoming:						
North Platte.....	51,684.52	159,957.73	56,276.05	158,464.49	2.00	1,491.24
Nevada:						
Newlands.....	1,885.10	15,653.27	1,800.35	15,568.52		84.75
New Mexico:						
Carlsbad.....	1,473.70	18,858.44	1,473.70	18,858.44		
Hondo.....		9,165.19		9,129.70		35.49
New Mexico-Texas:						
Rio Grande.....	1,575.00	1,090,101.25	57,432.31	1,043,848.57		46,252.68
North Dakota:						
North Dakota Pumping.....		2,149.03		2,149.03		
Oregon:						
Umatilla.....	2,674.05	30,786.09	1,125.89	29,810.05	609.42	366.62
Oregon-California:						
Klamath.....	1,241.14	42,189.62	734.39	41,665.96		523.66
South Dakota:						
Belle Fourche.....	793.16	4,651.38	793.16	4,501.38		150.00
Utah:						
Strawberry Valley.....		8,388.39		8,388.39		
Washington:						
Okanogan.....	457.25	109,976.27	410.40	105,860.29	2,319.09	1,796.89
Yakima.....	5,118.89	136,437.67	5,877.31	135,696.75		740.92
Wyoming:						
Shoshone.....	1,672.36	11,518.77	1,604.80	11,050.59		468.18
Total.....	349,706.55	7,141,725.75	390,760.99	6,899,487.42	12,279.23	229,959.10

*Statement of uncollected balances (not including construction and operation and maintenance repayments and water rentals) as of June 30, 1922.*

State and project.	Power and light.	Grazing and farming lands.	Miscellaneous.	Total.
Arizona-California:				
Yuma.....		\$663.72	\$5,065.94	\$5,729.66
California:				
Orland.....			4.60	4.60
Colorado:				
Grand Valley.....		62.00	79.82	141.82
Uncompahgre.....			201.76	201.76
Idaho:				
Boise.....		110.63	6,554.53	6,665.16
King Hill.....			483.86	483.86
Minidoka.....	\$23,751.83	5,240.42	1,757.43	30,749.68
Montana:				
Huntley.....		964.42	73.00	1,037.42
Milk River.....		664.82	4,766.43	5,431.25
Sun River.....		4,761.55	416.36	5,177.91
Montana-North Dakota:				
Lower Yellowstone.....		33.00	901.34	934.34
Nebraska-Wyoming:				
North Platte.....	2,211.06	4,965.13	58,360.49	65,536.68
Nevada:				
Newlands.....	1,462.84	38.40	1,068.13	2,569.37
New Mexico:				
Carlsbad.....		204.34	152.94	447.28
New Mexico-Texas:				
Rio Grande.....		8.00	2,789.64	2,797.64
North Dakota:				
North Dakota Pumping.....	3,758.50		27.61	3,786.11
Oregon:				
Umatilla.....			871.53	871.53
Oregon-California:				
Klamath.....		2,696.72	2,423.02	5,119.74
South Dakota:				
Belle Fourche.....			192.90	192.90
Utah:				
Strawberry Valley.....	1,618.71		467.30	2,086.01
Washington:				
Okanogan.....			1,507.35	1,507.35
Yakima.....		233.30	1,019.77	1,253.07
Wyoming:				
Riverton.....			523.13	523.13
Shoshone.....	318.60	305.25	1,717.25	2,341.10
Secondary projects.....		653.91	33,958.50	34,612.41
Washington office.....			2,443.98	2,443.98
Denver office.....			24,111.81	24,111.81
Total.....	33,121.54	21,725.61	151,940.42	206,787.57

<sup>1</sup> Includes unadjusted transfers between projects.

## NET INVESTMENT.

The total set aside by the United States for reclamation purposes, as shown by the statement of assets, liabilities, and capital, including the unpaid balance of the bond loan, amounts to \$134,826,038.23. Of this there is on hand \$4,302,884.53 in the reclamation fund and \$1,225.87 in the Wind River Indian fund, the difference amounting to \$130,521,927.83 being invested. The net investment by projects is set forth in the following statement:

*Voucher transactions and net investment as of June 30, 1922, reclamation fund projects, including Wind River (Riverton).*

	Expenditures. <sup>1</sup>		Collections.		Net investment.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Arizona:						
Salt River.....		\$14, 671, 484. 24	\$838. 95	\$4, 734, 165. 23	*\$838. 95	\$9, 937, 319. 01
Arizona-California:						
Yuma.....	\$414, 965. 52	11, 642, 765. 63	323, 229. 65	2, 528, 201. 10	91, 735. 87	9, 114, 564. 53
California:						
Orland.....	74, 300. 12	1, 397, 851. 52	88, 433. 80	493, 527. 77	*14, 133. 68	904, 323. 75
Colorado:						
Grand Valley.....	94, 335. 01	4, 121, 204. 39	47, 886. 63	257, 043. 96	46, 448. 38	3, 864, 160. 53
Uncompahgre.....	160, 882. 69	7, 991, 315. 55	136, 789. 79	1, 808, 116. 33	24, 092. 90	6, 685, 199. 22
Idaho:						
Boise.....	338, 150. 01	15, 225, 178. 05	575, 450. 83	3, 550, 523. 25	*237, 300. 82	11, 674, 654. 80
King Hill.....	271, 325. 77	1, 615, 039. 71	29, 556. 98	67, 780. 55	241, 768. 79	1, 547, 279. 16
Minidoka.....	392, 963. 28	8, 990, 876. 24	570, 872. 39	4, 240, 730. 94	*177, 609. 11	4, 650, 145. 30
Kansas:						
Garden City.....		390, 495. 54	504. 89	57, 688. 77	*504. 89	332, 856. 77
Montana:						
Huntley.....	45, 427. 08	2, 381, 139. 84	42, 138. 35	707, 770. 58	3, 288. 68	1, 673, 369. 26
Milk River.....	275, 034. 75	4, 115, 319. 83	34, 268. 06	202, 700. 61	240, 786. 09	3, 912, 619. 32
St. Mary Storage.....	34, 035. 71	2, 878, 453. 93	10, 971. 43	109, 071. 72	23, 064. 28	2, 789, 382. 21
Sun River.....	126, 078. 59	4, 399, 569. 51	26, 793. 21	402, 418. 37	99, 285. 38	3, 997, 151. 14
Montana-North Dakota:						
Lower Yellowstone.....	196, 859. 50	3, 925, 608. 31	12, 287. 69	279, 052. 71	184, 571. 81	3, 646, 558. 60
Nebraska-Wyoming:						
North Platte.....	1, 140, 684. 19	15, 335, 420. 61	416, 275. 67	3, 322, 073. 03	733, 408. 52	12, 013, 347. 58
Nevada:						
Newlands.....	490, 844. 19	8, 119, 057. 91	153, 419. 80	1, 439, 828. 71	337, 424. 39	6, 679, 229. 20
New Mexico:						
Carlsbad.....	58, 709. 32	1, 917, 038. 21	98, 158. 94	746, 006. 38	*44, 449. 62	1, 171, 031. 83
Hondo.....		406, 744. 36		34, 841. 70		371, 902. 66
New Mexico-Texas:						
Rio Grande.....	941, 780. 23	13, 743, 371. 15	230, 161. 07	1, 814, 727. 18	711, 599. 16	11, 928, 643. 97
North Dakota:						
North Dakota Pumping.....	70, 462. 41	1, 449, 229. 46	63, 176. 20	377, 511. 63	7, 286. 21	1, 071, 717. 83
Oregon:						
Umatilla.....	142, 255. 00	3, 290, 933. 16	40, 910. 60	733, 570. 24	101, 344. 40	2, 557, 362. 92
Oregon-California:						
Klamath.....	424, 071. 76	4, 376, 997. 10	128, 806. 83	1, 088, 417. 97	295, 264. 92	3, 290, 579. 13
South Dakota:						
Belle Fourche.....	195, 737. 49	4, 568, 786. 81	69, 160. 06	1, 040, 983. 62	126, 577. 48	3, 537, 805. 19
Utah:						
Strawberry Valley... ..	58, 329. 32	4, 146, 316. 72	152, 652. 48	950, 098. 14	*94, 323. 16	3, 196, 218. 58
Washington:						
Okanogan.....	115, 569. 06	1, 761, 463. 36	60, 490. 92	341, 286. 64	55, 078. 14	1, 420, 076. 72
Yakima.....	932, 440. 71	14, 259, 056. 27	655, 985. 21	5, 361, 642. 74	276, 455. 50	8, 997, 516. 53
Wyoming:						
Riverton.....	306, 867. 75	855, 191. 44	2, 070. 05	20, 029. 18	304, 797. 70	835, 162. 28
Shoshone.....	880, 474. 90	8, 622, 907. 93	98, 826. 73	1, 191, 754. 26	781, 648. 17	7, 431, 153. 67
Secondary (including Deschutes and Imperial Valley).....	232, 385. 53	1, 724, 489. 09	187, 008. 63	486, 632. 06	45, 381. 90	1, 237, 857. 08
Denver office (net not transferred).....	34, 095. 58	216, 271. 04	13, 744. 65	109, 732. 84	20, 350. 93	106, 538. 20
Washington office (net not transferred).....	19, 784. 11	334, 805. 00	23, 990. 11	257, 747. 69	*4, 206. 00	77, 057. 31
Indian projects (old accounts).....		2, 997, 829. 24		2, 997, 829. 24		
Civil service retirement deductions, unabsorbed).....	*4, 711. 20	1, 148. 62			*4, 711. 20	1, 148. 62
Total.....	8, 468, 118. 32	171, 873, 362. 77	4, 294, 555. 60	41, 351, 434. 94	4, 173, 562. 72	130, 521, 927. 83

\* Contra.

<sup>1</sup> Expenditures reclamation fund: Disbursements plus transfers from other projects, less transfers to other projects.

<sup>2</sup> Expended for the Office of Indian Affairs from reclamation fund and later reimbursed by congressional appropriation.

*Voucher transactions and net investment as of June 30, 1922, reclamation fund projects, including Wind River (Riverton)—Continued.*

	Expenditures.		Collections.		Net investment.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Less: Riverton Indian Service investment*.....	\$266.08	\$376,953.73	\$48.26	\$985.46	\$217.82	\$375,968.27
Reclamation Service investment.....	8,467,852.24	171,496,409.04	4,294,507.34	41,350,449.48	4,173,344.90	130,145,959.56
Reclamation Service investment analyzed:						
Reclamation fund.....	8,040,060.75	167,754,976.51	4,294,507.34	41,350,449.48	3,745,543.41	126,404,527.03
Net increase compensation funds.....	327,572.56	2,191,084.95			327,572.56	2,191,084.95
Judgments, Court of Claims.....	100,228.93	550,347.58			100,228.93	550,347.58
Rio Grande dam appropriations.....		1,000,000.00				1,000,000.00
Total.....	8,467,852.24	171,496,409.04	4,294,507.34	41,350,449.48	4,173,344.90	130,145,959.56

NOTE.—Denver and Washington office investment represents under or over distributed expenditures, analyzed as follows:

	Denver Office.		Washington Office.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Reclamation fund disbursements.....	\$270,399.15	\$1,558,421.88	\$221,779.71	\$4,740,968.18
Net increase of compensation disbursements.....	16,870.54	67,107.99	16,624.58	69,069.21
Total disbursements.....	287,269.69	1,625,529.84	238,404.29	4,810,077.39
Less:				
Net transfers.....	253,174.11	1,409,258.80	218,620.18	4,475,272.39
Net expenditure.....	34,095.58	216,271.04	19,784.11	334,805.00
Reclamation fund collections.....	13,744.65	109,782.84	23,990.11	257,747.69
Net investment.....	20,350.93	106,538.20	*4,206.00	77,067.31

\* Contra.



The investment as given in the foregoing statement is designated as for "reclamation fund projects" for the reason that the reclamation fund is the principal source from which expenditures are made in the construction of the projects named.

Other activities not included in "reclamation fund projects" are construction of mesa division of Yuma project; investigation of drainage and timber cut-over lands; construction of Indian projects.

The mesa division of the Yuma project or Yuma auxiliary is being constructed from funds advanced by purchasers of lands and water rights. No part of the reclamation fund is used in connection with this project. The expenditures are therefore less than the collections, resulting in a "contra" net investment which is in a sense a liability to the purchasers of lands and water rights.

The investigation of drainage and cut-over lands was made from an appropriation from the General Treasury.

The expenditures in connection with Indian projects are made from appropriations for the Office of Indian Affairs, the Reclamation Service acting as agent.

The following statement sets forth the net investment for the fiscal year and to date for each of these three activities:

	Expenditures.		Collections.		Net investment.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
<b>Mesa division, Yuma project:</b>						
Auxiliary fund.....	\$288,940.84	\$501,572.46	\$133,199.13	\$557,279.76	\$155,741.71	*\$55,707.30
Increase of compensation fund (net).....	3,319.82	12,462.38	.....	.....	3,319.82	12,462.38
<b>Total.....</b>	<b>292,260.66</b>	<b>514,034.84</b>	<b>133,199.13</b>	<b>557,279.76</b>	<b>159,061.53</b>	<b>*43,244.92</b>
<b>Drainage and cut-over fund.....</b>	<b>21.01</b>	<b>100,279.59</b>	<b>.....</b>	<b>464.51</b>	<b>21.01</b>	<b>99,815.08</b>
Increase of compensation fund (net).....	.....	728.94	.....	.....	.....	728.94
<b>Total.....</b>	<b>21.01</b>	<b>101,008.53</b>	<b>.....</b>	<b>464.51</b>	<b>21.01</b>	<b>100,544.02</b>
<b>Indian projects (Montana):</b>						
<b>Blackfeet—</b>						
Indian funds.....	35,712.36	1,198,097.31	16,085.42	38,952.24	19,676.94	1,159,145.07
Increase of compensation fund (net).....	2,298.30	11,564.85	.....	.....	2,298.30	11,564.85
Judgments, Court of Claims.....	.....	29.91	.....	.....	.....	29.91
<b>Total.....</b>	<b>38,010.66</b>	<b>1,209,692.07</b>	<b>16,085.42</b>	<b>38,952.24</b>	<b>21,975.24</b>	<b>1,170,739.93</b>
<b>Flathead—</b>						
Indian funds.....	184,699.92	4,661,014.41	48,490.69	182,751.84	136,209.23	4,478,262.57
Increase of compensation fund (net).....	9,899.23	136,702.95	.....	.....	9,899.23	136,702.95
<b>Total.....</b>	<b>194,599.15</b>	<b>4,797,717.36</b>	<b>48,490.69</b>	<b>182,751.84</b>	<b>146,108.46</b>	<b>4,614,965.52</b>
<b>Fort Peck—</b>						
Indian funds.....	32,850.14	890,221.62	13,725.81	23,717.12	19,124.33	866,504.50
Increase of compensation fund (net).....	1,526.66	16,176.13	.....	.....	1,526.66	16,176.13
Judgments, Court of Claims.....	.....	168.34	.....	.....	.....	168.
<b>Total.....</b>	<b>34,376.80</b>	<b>906,566.09</b>	<b>13,725.81</b>	<b>23,717.12</b>	<b>20,650.99</b>	<b>882,848.97</b>

\* Contra.

## DISCUSSION OF PROJECTS.

### PRIMARY PROJECTS.

#### ARIZONA, SALT RIVER PROJECT.

C. C. CRAGIN, Salt River Valley Water Users' Association, general superintendent and chief engineer, Phoenix, Ariz.

[The operation of the Salt River project was turned over to the water users on November 1, 1917. The Reclamation Service desires to express its appreciation of the co-operation of the Salt River Valley Water Users' Association in furnishing the following statement concerning the operations of the project during the fiscal year.]

The Salt River project is situated in Maricopa and Gila Counties, Ariz., and is populated by 76,100 people living on some 5,000 farms and in 14 towns. The water supply is the Salt and Verde Rivers augmented by wells located in various parts of the valley. Records show an average annual rainfall of 8.34 inches over a period of 35 years, and a range of temperature from 22° to 117° F. The soil is sandy loam and silt and the length of the irrigation season is 365 days, October 1 to September 30. The principal crops raised on the project are alfalfa, cotton, grain, citrus and deciduous fruits, and marketing points are Phoenix and other Arizona towns, Pacific coast cities, and the eastern market.

The Roosevelt Reservoir, created by the building of Roosevelt Dam at the confluence of the Tonto Creek and the Salt River, is 70 miles northeast of Phoenix. The stored water is carried down the Salt River to the Granite Reef Diversion Dam, which is situated approximately 4 miles below the mouth of the Verde River, where, together with such water as may be discharged from the Verde River, it is diverted to the north and south side canal systems. The water supply of the canals on the north side of the Salt River is further augmented by the water diverted at Joint Head Diversion Dam. There are now eight pumping plants in operation, with an approximate capacity of 3 second-feet each, and 79 pumping plants with capacities ranging from 1 to 4 second-feet. The present canal and lateral system comprises 863.35 miles, together with 111.50 miles of waste ditches, 1 mile of open drains, and 3.75 miles of closed drains. Power is generated at the Roosevelt power plant from the stored water. There are four other power plants at various locations on the project—the South Consolidated, Arizona Falls, Cross Cut, and Chandler. The power derived from these plants is used for pumping water for irrigation, drainage, and for commercial purposes.

#### SUMMARY OF DATA FOR SALT RIVER PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage of project on completion.....		213,000
Public land entered to June 30, 1922.....	16,170	
Private land, June 30, 1922.....	196,830	
Acreage irrigated, season of 1921.....		202,480
Acreage cropped under irrigation, season of 1921.....		191,000
Value of irrigated crops, season of 1921.....		\$41,435,386
Value of irrigated crops per acre cropped.....		\$59.87
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....		\$1,000
Unencumbered balance July 1, 1922.....		\$1,000
Fiscal year 1923, amount specified in appropriation act.....		\$5,000

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....		\$10,548,119.28
Less—		
Loss.....		382,014.17
Water-right contracts: Project lands.....		10,166,021.97
Penalties.....	\$53.14	83.14
Total.....	83.14	10,548,119.28
Balance.....	\$83.14	

\* Contra.

*Summary of data for Salt River project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Increase of compensation.	Total.
Investment to date:			
Disbursements and net transfers.....	\$14,662,033.96	\$9,450.28	\$14,671,484.24
Less collections.....	4,734,165.23		4,734,165.23
Net investment.....	9,927,868.73	9,450.28	9,937,319.01

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected, cash.		Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	
To return net construction cost:					
Water-right charges.....	\$406,640.88	\$1,219,922.64	\$755.81	\$610,717.13	\$609,205.51
Penalties.....	83.14	83.14	83.14	83.14	
Total.....	406,724.02	1,220,005.78	838.95	610,800.27	609,205.51
Revenues:					
Rentals of irrigating water.....		2,246,726.01		2,246,726.01	
Rentals of power and light.....		998,411.03		998,411.03	
Rentals of grazing and farming lands.....		19,373.14		19,373.14	
Total.....		3,264,510.18		3,264,510.18	
Other miscellaneous collections.....				858,854.78	
Grand total collections.....			838.95	4,734,165.23	

**ACTIVITIES DURING FISCAL YEAR.**

An extensive waste-ditch program has been carried on during the year, the program calling for the disposition of the waste water at the low point of each quarter section within the project, and the construction, operation, and maintenance of approximately 375 miles of ditches.

Owing to the large paving program being carried on by Maricopa County, it has been necessary to put a special crew in the field to install undercrossings for present and future irrigation and waste ditches. This crew has installed 6,550 linear feet of concrete pipe and 5,498 linear feet of corrugated pipe. There were 54½ miles of waste ditches and 11 miles of irrigation ditches constructed during the year and 190 bridges installed for farm crossings. Twenty-five new pump houses were constructed.

The Monighan 2-yard walking type and the rebuilt Lidgerwood 1½-yard drag lines operated continuously on the widening of the Eastern Canal and excavated 203,000 cubic yards of caliche and boulders.

Additional improvements were made to the Ruth excavator and this machine was very successfully operated berming the banks of the Eastern, east branch of the Consolidated, the Western, and the Grand Canals. Main canals were successfully demossed with heavy anchor chains drawn by 12 head of stock.

The P. & H. ½-yard excavator operated on the deepening of the Western Canal above the Highline pumping plant.

*Operation data, Salt River project.*

Item.	1920-21	1921-22
Acres for which works were prepared to supply water .....	213,000	213,168
Acres irrigated .....	205,080	203,348.50
Miles of canals operated .....	852.75	863.35
Water diverted (acre-feet) .....	<sup>1</sup> 1,371,983	1,231,081
Water delivered to land (acre-feet) .....	594,615	534,526.07
Acre-feet per acre for area under cultivation .....	2.90	<sup>2</sup> 2.635

<sup>1</sup> Includes 307,455 acre-feet wasted; water for Salt River Valley Water Users' system only; outside water deducted.

<sup>2</sup> Amount of water per acre actually charged for; 20 per cent less than the amount of water delivered to the land.

*Settlement data, Salt River project.*

Item.	1920	1921
Total number of farms on project (when completed) .....	<sup>1</sup> 4,700	5,000
Number of farms reported .....	<sup>1</sup> 4,200	5,000
Population .....	<sup>2</sup> 31,600	33,800
Number of towns .....	14	14
Population .....	39,795	42,500
Total population of towns and farms .....	71,395	76,100
Number of public schools .....	<sup>1</sup> 57	60
Number of churches .....	62	65
Number of banks .....	20	20
Total capital stock of banks .....	\$1,752,500.00	\$1,755,500
Amount of deposits .....	\$24,426,056.95	\$17,776,336
Number of depositors .....	<sup>1</sup> 35,000	38,000

<sup>1</sup> Estimated.

<sup>2</sup> Includes population within town-site areas.

# ARIZONA-CALIFORNIA, YUMA PROJECT.

PORTER J. PRESTON, project manager, Yuma, Ariz.

The Yuma project comprises 65,000 acres of irrigable land along the Colorado River for a distance of about 28 miles from the boundary between Arizona and Mexico, in Yuma County, Ariz., and Imperial County, Calif. The water supply is diverted from the Colorado River at Laguna Dam 10 miles northeast of Yuma on the California side and is carried under the river at Yuma by an inverted siphon. Building charges are \$55, \$66, \$75, \$77, and \$90 per acre for gravity lands. The limit of area of farm units is 40 acres. The duty of water averages 3 acre-feet at the farm. The soils are rich alluvium bottom land; the principal crops are cotton and alfalfa. The irrigation season is 365 days. The average temperatures for 29 years are: High, 115°, low 28°; rainfall, 40-year average, 3.1 inches.

The Mesa division comprises about 45,000 acres of mesa land in the southwest corner of Yuma County. The land is irrigated by pumping from the East Main Canal.

## SUMMARY OF DATA FOR YUMA PROJECT TO END OF FISCAL YEAR 1922.

Areas and crops:			
Irrigable acreage when project is complete.....			110,000
Public land entered to June 30, 1922.....	18,060		
Public land open to entry on June 30, 1922.....	286		
Public land withdrawn on June 30, 1922.....	23,284		
Indian land, June 30, 1922.....	8,200		
Private land, June 30, 1922.....	50,170		
Acreage Service could supply, season of 1921.....			65,000
Acreage irrigated, season of 1921.....			52,400
Acreage cropped under irrigation, season of 1921.....			52,400
Value of irrigated crops, season of 1921.....			\$2,098,060
Value of irrigated crops per acre cropped.....			\$40.04
Finances:			
Appropriations—			
Fiscal year 1922, all congressional authorizations.....	\$496,683.13		
Encumbrances, disbursements and liabilities.....	424,130.71		
Unencumbered balance July 1, 1922.....			\$72,552.42
Fiscal year 1922, amount specified in appropriation act.....			550,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$196,541.59	\$8,942,183.14
Less—			
Funds advanced and unapplied cooperative credits.....		277,029.10	101,113.89
Water-right contracts—			
Project lands (56,155 acres).....		114,463.50	5,611,355.53
Total.....		1162,565.60	5,712,469.42
Balance.....		133,975.99	3,229,713.72
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$330,742.08	\$1,276,629.68	\$308,419.16
Less—			
Charges billed or contracted.....	260,970.64	880,248.53	256,201.47
Penalties and discounts (net).....	*343.46	1,914.77	2,053.45
Total.....	260,627.18	882,163.30	258,254.92
Balance.....	70,114.90	394,466.38	50,164.24
			517,301.08

\* Contra.

	Reclamation fund.	Increase of compensation.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$11,515,823.14	\$126,942.49	\$11,642,765.63
Less collections.....	2,528,201.10		2,528,201.10
Net investment.....	8,987,622.04	126,942.49	9,114,564.53

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost: Funds advanced and unapplied cooperative credits..... Water-right charges.....						
	\$141,350.62	\$101,113.89 885,653.07	\$110,860.94	\$101,113.89 825,769.63	\$951.26	\$58,932.18
Total.....	141,350.62	986,766.96	110,860.94	926,883.52	951.26	58,932.18
Construction water-right charges paid in advance.....				4,437.76		
To return net operation and maintenance cost: Operation and maintenance charges— Project lands (63,197 acres)..... Penalties and interest.....						
	256,201.47 4,872.25	884,720.93 11,656.31	162,435.80 4,597.65	674,324.24 11,581.71	12,264.63 274.60	198,132.06
Total.....	261,073.72	896,377.24	167,033.45	685,705.95	12,539.23	198,132.06
Operation and maintenance charges paid in advance.....				859.50		
Revenues: Rentals of irrigating water..... Rentals of grazing and farming lands.....						
	11,799.67 1,754.09	462,761.51 9,324.11	12,803.39 1,820.29	460,419.68 8,660.39	101.55	2,240.28 663.72
Total.....	13,553.76	472,085.62	14,623.68	469,080.07	101.55	2,904.00
Miscellaneous uncollected <sup>1</sup> .....						257,065.94
Other miscellaneous collections.....			30,711.58	441,234.30		
Grand total collections.....			323,229.65	2,528,201.10		

<sup>1</sup> Includes \$252,000 to be reimbursed from the Yuma auxiliary, a special fund.

### ACTIVITIES DURING FISCAL YEAR.

Construction was confined largely to drainage work on the South, East, East Central, and North Drains, using a 1-yard and a 2-yard drag line. Nine miles of open drain were built, the excavation comprising 263,600 cubic yards of earth. Each machine worked two shifts. Ten metal flumes, 11 timber highway bridges, and 6 minor structures were built in connection with drainage work. There was no seeped land at the close of the fiscal year except in the bottoms of deep sloughs.

Practically all ditch cleaning was done by Ruth dredges, of which four were in operation. During the year 165 miles of laterals were cleaned; 4.4 miles of drain were cleaned by drag lines.

On July 1, 1921, the river broke through the levee below Yuma, flooding 1,675 acres of land, of which 1,100 were cultivated. This necessitated rebuilding about one-half mile of the levee and West Main Canal, involving 32,000 cubic yards of earthwork and 17,800 cubic yards of rock revetment. On September 30 a heavy rainstorm washed large quantities of sand and gravel into the main canal on the Reservation division, breaking the banks in several places. Repairs involved the handling of 62,000 cubic yards of material. The total cost of repairing the above flood damage was \$76,000.

The operation and maintenance charge for 1922 is \$4 per acre minimum for 2½ acre-feet or 3½ acre-feet for certain sandy lands, with excess water at \$1 or an alternate choice of \$4.50 minimum for

2½ acre-feet, with excess water, at 50 cents per acre-foot. About 7,700 acres accepted the latter alternate. Wash water for reclaiming alkali land is furnished at 50 cents per acre-foot, the cost of pumping drainage water on the Valley division, and free of charge on the Reservation division, where pumping is not required; also water in excess of the amount delivered under the minimum charge, which is to be used for growing fertilizer crops or depositing silt on certain sandy land, is furnished free of charge. The time within which water-right application must be made for lands in excess of 160 acres held by one person, lands held by nonresident owners, and land held under homestead entries in excess of one farm unit, was extended by order of the Secretary to December 1, 1924, after which no water will be furnished except under water-right application.

**Mesa division.**—The building of the B lift pumping plant and 72-inch force main was continued and carried to completion. All machinery was installed and the plant was tested out in March. The plant was put in operation May 1, 1922. At the Mesa quarry and pipe manufacturing plant, 41,008 linear feet of lock-joint pipe were manufactured between November 1 and April 25. Laterals were built and turnouts installed for the delivery of water to 2,450 acres of mesa land.

During the fiscal year 60,000 cubic yards of excavation were made (mostly trenches for the laying of lock-joint pipe), 3,800 cubic yards of concrete were placed, 5,200 cubic yards of rock were crushed for concrete aggregate, and 41,008 linear feet of lock-joint pipe were cast.

*Operation data, Yuma project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Area for which service was prepared to supply water.....	72,440	73,000	73,000	170,000	165,000	165,000
Acres irrigated.....	29,483	26,946	45,670	53,294	54,550	52,400
Miles of canal operated.....	316	335	338	323.2	323.2	323.2
Water diverted (acre-feet) <sup>1</sup> .....	249,700	237,597	314,900	478,185	468,900	482,000
Water delivered to land (acre-feet).....	94,393	136,541	156,229	155,417	160,330	140,900
Acre-feet to acre for area under cultivation.	3.2	3.7	3.3	2.9	2.94	2.66

<sup>1</sup> Reduction due to exclusion of North Gila Valley land and lands along levees subject to seepage.

<sup>2</sup> Of the water diverted, from 100,000 to nearly 200,000 acre-feet each year are wasted, of which the largest part flows into the Colorado River at the Colorado spillway above Yuma, and this water can be diverted for irrigation farther down the river.

*Settlement data, Yuma project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project (when completed).....	4,000	4,000	4,000	5,190	5,750	5,750
Number of farms reported.....	790	900	1,185	1,225	1,230	1,211
Population.....	2,002	2,700	4,300	5,000	5,100	4,800
Number of towns.....	6	6	6	6	6	6
Population.....	5,345	6,735	7,590	7,600	7,110	6,665
Total population of towns and farms...	7,347	9,435	11,890	12,600	12,210	11,465
Number of public schools.....	17	20	20	18	15	16
Number of churches.....	9	9	10	11	23	23
Number of banks.....	4	4	4	6	6	5
Total capital stock of banks.....			\$175,000	\$255,000	\$255,000	\$230,000
Amount of deposits.....			\$1,321,468	\$1,923,287	\$2,100,000	\$1,927,000
Number of depositors.....			4,572	5,288	9,175	5,900

<sup>1</sup> Reduction due to consolidation.

<sup>2</sup> Religious organizations; figures prior to 1920 relate to church buildings.

## CALIFORNIA, ORLAND PROJECT.

R. C. E. WEBER, project manager, Orland, Calif.

The Orland project is located in Glenn and Tehama Counties, with reservoir in Colusa County. Stony Creek, the source of the water supply, has a drainage area of 735 square miles above the project diversion dam; the annual mean run-off near Fruto is 405,000 acre-feet.

The average elevation above sea level is 250 feet; the mean rainfall, 18.4 inches; and the temperature range, 21° to 114° F. The soil is sandy and gravelly loam, silt loam, and clay loam. The principal products are alfalfa, milo, citrus and other fruits, nuts, and vegetables. The limit of area of farm units is 40 acres, except that original subscribers are qualified to hold up to 160 acres.

The irrigation plan provides for storage at East Park Reservoir on Little Stony Creek with a feed canal 7 miles long connecting the reservoir with Stony Creek. For the irrigation of project lands located in the vicinity of Orland, water is diverted from Stony Creek by two diversion weirs into the South and North Canals, which serve 14,600 and 6,100 acres of land, respectively. Stored water from the reservoir is conveyed in the natural channel of Stony Creek to the project diversions. The distribution system consists of 2,000 structures and 146 miles of canals and laterals, 71 miles of which are concrete lined. The plan also includes a high-line canal, from which power may be developed for pumping. The present limits may be considered as a division of the Sacramento Valley project. It may be extended by constructing additional reservoirs on Stony Creek, the most feasible of which appears to be Millsite, near Fruto.

### SUMMARY OF DATA FOR ORLAND PROJECT TO END OF FISCAL YEAR 1922.

#### Areas and crops:

Irrigable acreage when project is complete.....	20,657
Private land, June 30, 1922.....	20,657
Acreage service could supply, season of 1921.....	20,657
Acreage irrigated season of 1921.....	14,700
Acreage cropped under irrigation, season of 1921.....	11,450
Acreage dry-farmed, season of 1921.....	400
Value of irrigated crops, season of 1921.....	\$498,810
Value of irrigated crops per acre cropped.....	\$43.30
Value of dry-farmed crops, season of 1921.....	\$3,200
Value of dry-farmed crops per acre cropped.....	\$8.00

#### Finances:

##### Appropriations—

Fiscal year 1922, all congressional authorizations.....	\$125,735.35
Encumbrances, disbursements and liabilities.....	74,218.06
Unencumbered balance July 1, 1922.....	\$51,522.30
Fiscal year, 1922, amount specified in appropriation act.....	125,000.00

			Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>				
Net construction cost.....			\$42,025.78	\$1,057,969.13
Less—				
Funds advanced and unapplied cooperative credits.....			347.16	621.23
Water-right contracts—				
Project land..... 19,336.95 acres..			2,321.00	1,063,532.25
Total.....			2,668.16	1,064,153.48
Balance.....			39,357.62	\$6,194.35
	Calendar year 1921.	To Dec. 31, 1921.		
Net operation and maintenance cost.....	\$37,566.48	\$165,191.22	30,352.31	180,035.43
Less—				
Charges billed or contracted.....	41,550.17	173,208.44	41,550.17	173,208.44
Penalties and discounts (net).....	\$2,089.12	\$6,583.27	\$2,089.12	\$6,583.27
Total.....	39,491.05	164,673.17	39,491.05	164,673.17
Balance.....	\$1,894.57	518.05	\$9,138.74	15,362.26

\* Construction cost includes \$13,242.34 spent on Millsite investigations.

\* Contra.

† Includes 320 acres vested rights, 145 acres town, and 17 acres school sites.



*Summary of data for Orland project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Increase of compensation.	Total.
Investment to date:			
Disbursements and net transfers.....	\$1, 373, 478. 36	\$24, 373. 16	\$1, 397, 851. 52
Less collections.....	493, 527. 77		493, 527. 77
Net investment.....	879, 950. 59	24, 373. 16	904, 323. 75

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Funds advanced and unapplied cooperative credits.....	\$347. 16	\$621. 23	\$347. 16	\$621. 23		
Water-right charges.....	44,388. 63	168,663. 42	44,388. 63	168,663. 42		
Total.....	44,735. 79	169,284. 65	44,735. 79	169,284. 65		
Construction water right charges paid in advance.....				5,385. 16		
To return net operation and maintenance cost:						
Operation and maintenance charges—						
Project lands (20,176.66 acres).....	41,544. 52	173,206. 44	39,375. 04	164,531. 89	\$8,564. 34	\$110. 21
Penalties and interest.....	. 15	31. 07	. 15	31. 07		
Total.....	41,544. 67	173,237. 51	39,375. 19	164,562. 96	8,564. 34	110. 21
Revenues:						
Rentals of irrigating water..	229. 50	120,154. 50	229. 50	120,154. 50		
Rentals of grazing and farming lands.....		32. 00		32. 00		
Total.....	229. 50	120,186. 50	229. 50	120,186. 50		
Miscellaneous uncollected.....						4. 60
Other miscellaneous collections.....			4,093. 32	34,108. 50		
Grand total collections.....			88,433. 80	493,527. 77		

<sup>1</sup> Discounts.**ACTIVITIES DURING FISCAL YEAR.**

Construction during the fiscal year consisted of placing 101,297 square yards of concrete lining on 12.1 miles of laterals under supplemental construction. Surveys and investigations in connection with the proposed development of additional storage on Stony Creek at Millsite were undertaken at the request of the board of directors of the Orland Unit Water Users' Association, who have agreed to repay the cost of the investigation up to an amount not exceeding \$10,000 by increased operation and maintenance charges, in event no construction is undertaken, to absorb the preliminary expense. The work performed consisted of a detail topographic survey of the dam site, extension of the reservoir topography to the 680 foot contour, and diamond drilling at the dam site, field work on all of which except the latter was completed during the fiscal year.

The rainfall during the winter preceding the irrigation season of 1921 was sufficient to provide full storage at East Park Reservoir and the natural flow of the creek was such that draft on storage was not necessary until the middle of June. As a result an ample water supply was available and agricultural conditions in general were favorable for good crop yields. No extensive renewals were necessary and no unusual difficulties encountered in operating and maintaining the irrigation works.

*Operation data, Orland project, by calendar years.*

	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	<sup>1</sup> 20,533	<sup>1</sup> 20,533	<sup>1</sup> 20,533	<sup>1</sup> 20,533	<sup>2</sup> 20,657
Acreage irrigated.....	12,729	14,764	15,208	13,872	14,700
Miles of canal operated.....	138	138	138	138	146
Water stored (acre-feet).....	51,000	46,900	51,000	62,000	13,680
Water diverted (acre-feet).....	74,000	45,900	72,000	33,800	68,887
Water delivered to land (acre-feet).....	44,400	28,300	45,000	20,600	44,200
Per acre of land irrigated (acre-feet).....	3.50	1.91	2.95	1.49	3.01

<sup>1</sup> Includes 320 acres of vested water rights and 46 acres of town and school sites.

<sup>2</sup> Includes 320 acres of vested water rights and 162 acres of school and town sites.

**CROPS AND LIVE STOCK.**

About 82 per cent of the total irrigable area of the project was contained in the farms which were under irrigation in 1921. There was an increase of 800 acres in the area irrigated over that for the preceding year and 19 new farms were brought under irrigation. Alfalfa continued to be the predominating crop, followed by milo, to which about 2,000 acres were planted and which was the most uniform in growth and yield ever raised. Citrus fruits and almonds made a very appreciable gain in yield as a result of young orchards coming into bearing. Crop yields were greater than for 1920 owing to the limited water supply available during that year, but prices were lower for 1921, resulting in a decreased crop return. The dairy-ing industry partially recovered from the effects of the dry year of 1920 as evidenced in the increase, both in number and value, of dairy cattle during the year, together with the increase in butter production of the two Orland creameries. The stock and equipment inventory showed an increase of \$79,500 during the year.

*Settlement data, Orland project.*

	1917	1918	1919	1920	1921
Total number of farms on project.....	699	725	846	908	936
Population.....	1,900	2,000	2,250	2,200	2,250
Number of irrigated farms.....	531	593	602	644	663
Operated by owners.....	483	549	549	592	623
Operated by tenants.....	48	44	53	52	40
Population.....	1,518	1,589	1,768	1,844	1,862
Number of towns.....	1	1	1	1	1
Population.....	1,550	1,600	1,700	1,700	1,700
Total population.....	3,450	3,600	3,950	3,900	3,950
Number of public schools.....	8	9	10	10	10
Number of churches.....	7	7	7	7	7
Number of banks.....	2	2	2	2	2
Total capital stock.....	\$141,000	\$141,000	\$141,000	\$171,000	\$171,000
Amount of deposits.....	\$755,000	\$950,000	\$1,100,000	\$1,020,000	\$966,000
Number of depositors.....	2,420	2,800	3,000	2,900	2,800

## COLORADO, GRAND VALLEY PROJECT.

S. O. HARPER, project manager, Grand Junction, Colo.

The Grand Valley project is in Mesa County, Colo. The irrigation plan provides for the diversion of water from the Colorado River by means of a dam about 8 miles northeast of Palisade, Colo., into a canal system on the north side of the river, for the irrigation of 45,000 acres of land along the north boundary of the Grand Valley. About 35,000 acres will be supplied by gravity and 10,000 acres by electrically-operated pumping plants to be located on the gravity canal.

Water service is also furnished through the project works to 8,400 acres of land in the Palisade and Mesa County irrigation districts, and an extension is proposed to supply the Orchard Mesa irrigation district, which includes 10,000 acres of land on the south side of the Colorado River, to be known as the Orchard Mesa Pumping division.

The features which have been completed include the Colorado River diversion dam, the first 55 miles of the main canal extending from the headworks to West Salt Creek, and laterals to supply 30,500 acres of the gravity division of the project. A cooperative system of drains and outlets through the Grand Valley drainage district has been completed and several miles of drains have been constructed to reclaim the principal seeped areas on the project. A pumping plant and other works to supply the Palisade and Mesa County irrigation districts have also been completed. The uncompleted features are the last 7 miles of the main canal, laterals to supply 5,000 acres of the gravity division, the power and pumping systems, drainage works which may be required in the future, and the reconstruction of the Orchard Mesa irrigation system.

### SUMMARY OF DATA FOR GRAND VALLEY PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		55,000
Public land entered to June 30, 1922.....	13,442	
Public land open to entry on June 30, 1922.....	408	
Public land withdrawn on June 30, 1922.....	12,310	
Private land, June 30, 1922.....	28,845	
Acreage service could supply, season of 1921.....		1 28,400
Acreage irrigated, season of 1921.....		2 12,308
Acreage cropped under irrigation, season of 1921.....		3 11,880
Value of irrigated crops, season of 1921.....		\$356,730
Value of irrigated crops per acre cropped.....		\$31.22
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$431,767.83	
Encumbrances, disbursements and liabilities.....	87,230.90	
Unencumbered balance July 1, 1922.....		344,536.94
Fiscal year 1923, amount specified in appropriation act.....		440,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$34,017.28	\$3,765,198.61
Less funds advanced and unapplied cooperative credits.....		156.63
Balance.....	34,017.28	3,765,041.98

	Reclamation fund.	Increase of compensa- tion.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$4,055,858.95	\$65,345.44	\$4,121,204.39
Less collections.....	257,043.86		257,043.86
Net investment.....	3,798,815.09	65,345.44	3,864,160.53

<sup>1</sup> Includes Palisade and Mesa County irrigation districts.

<sup>2</sup> Project lands only.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Funds advanced and unapplied cooperative credits.....		\$156.63		\$156.63		
Revenues:						
Rentals of irrigating water.....	\$58,890.58	168,828.36	\$40,060.27	139,774.49	\$1,137.29	\$27,916.58
Rentals of grazing and farming lands.....	25.00	209.00	25.00	147.00	0	62.00
Total.....	58,915.58	169,037.36	40,075.27	139,921.49	1,137.29	27,978.58
Miscellaneous uncollected.....						79.82
Other miscellaneous collections.....			7,811.86	116,965.74		
Grand total collections.....			47,886.63	257,043.86		

### ACTIVITIES DURING FISCAL YEAR.

*Canal and lateral systems.*—Small sublaterals, required to supply lands not previously farmed, were completed and minor structures required for making deliveries to new lands installed. Two thousand linear feet of new laterals were constructed, involving 800 cubic yards of excavation, and 306 minor wooden structures installed.

*Drainage system.*—The construction of the cooperative system of drains and outlets through the Grand Valley drainage district was completed in September, 1921. Two drag-line excavators were operated on the drainage work during the year and completed 4.3 miles of open drain involving 135,000 cubic yards of excavation.

On February 18, 1922, a contract was entered into between the United States, the Grand Valley Water Users' Association, and the Orchard Mesa irrigation district providing for the expenditure of not to exceed \$1,000,000 for the reconstruction of the irrigation system, construction of a drainage system, and settlement of the outstanding indebtedness. At the end of the fiscal year the district had practically completed arrangements for the settlement of the indebtedness in accordance with the provisions of the contract, which will permit construction work to be started in the near future.

The total irrigable area included in the farms irrigated in 1921 was 19,806 acres. The total area irrigated on the project during the season was 12,300 acres and the area actually cropped was 11,390 acres, in addition to the 8,400 acres included in the two irrigation districts.

On account of the mild winter and lack of snowfall in the spring of 1921, there was a demand for water at a much earlier date than usual and diversions were started on March 15. On August 23 storms of unprecedented severity caused one bad break in the main canal. It was necessary to build a detour canal around the washed-out section, about 800 feet in length, and water service was not restored until September 7. There was little demand for irrigation water and practically no damage to crops resulted. The total damage to the project irrigation system from the storms amounted to about \$4,500 which was only a fraction of the damage to other irrigation systems in the valley.

*Operation data, Grand Valley project, by calendar years.*

Item.	1917	1918	1919	1920	1921
Acres for which service is prepared to supply water.	35,000	35,000	<sup>1</sup> 38,400	<sup>1</sup> 38,400	<sup>1</sup> 38,400
Acres irrigated.....	5,289	8,102	<sup>1</sup> 18,449	<sup>1</sup> 19,484	<sup>1</sup> 20,580
Miles of canals operated.....	150	188	175	178	175
Water diverted, acre-feet.....	55,891	74,352	<sup>1</sup> 133,364	<sup>1</sup> 142,527	<sup>1</sup> 145,416
Water delivered to land, acre-feet.....	18,715	29,856	<sup>1</sup> 38,307	<sup>1</sup> 36,024	<sup>1</sup> 43,978
Per acre of land irrigated.....	3.54	8.69	<sup>1</sup> 3.81	<sup>1</sup> 3.07	<sup>1</sup> 2.57

<sup>1</sup> Includes Palisade and Mesa County irrigation districts.<sup>2</sup> Project lands only.**CROPS AND SETTLEMENT.**

The principal crops produced on the project were alfalfa, sugar beets, apples, wheat, potatoes, oats, and corn. The yield of practically all crops was better than average but the returns were low. On account of the general depression in agriculture there was comparatively slight demand for farm lands and little progress along settlement lines was made.

*Settlement data, Grand Valley project.*

	1917	1918	1919	1920	1921
Total number of farms on project <sup>1</sup> .....	900	900	900	825	825
Population.....	480	759	884	1,019	1,064
Number of irrigated farms.....	202	317	324	376	402
Operated by owners or managers.....	97	186	201	251	264
Operated by tenants.....	105	131	123	125	138
Population.....	490	759	884	1,019	1,064
Number of towns.....	8	8	8	8	8
Population.....	<sup>2</sup> 10,700	<sup>2</sup> 10,700	<sup>2</sup> 11,266	<sup>2</sup> 11,415	<sup>2</sup> 11,246
Total population in towns and on farms...	<sup>2</sup> 11,180	<sup>2</sup> 11,459	<sup>2</sup> 12,150	<sup>2</sup> 12,434	<sup>2</sup> 12,310
Number of public schools.....	24	20	22	23	23
Number of churches.....	28	28	28	28	28
Number of banks.....	7	7	7	7	7
Total capital stock.....	<sup>2</sup> \$411,000	<sup>2</sup> \$432,000	<sup>2</sup> \$432,000	<sup>2</sup> \$465,000	<sup>2</sup> \$465,000
Total amount of deposits.....	<sup>2</sup> \$2,525,675	<sup>2</sup> \$3,030,621	<sup>2</sup> \$3,743,714	<sup>2</sup> \$3,256,780	<sup>2</sup> \$3,621,420
Total number of depositors.....	7,462	8,681	10,042	10,150	10,975

<sup>1</sup> Estimated.<sup>2</sup> These items include area adjacent to project.

## COLORADO, UNCOMPAHGRE PROJECT.

L. J. FOSTER, project manager, Montrose, Colo.

The Uncompahgre project is in southwestern Colorado, in Montrose and Delta Counties, on the Denver & Rio Grande Railroad. The project towns and population are, Montrose, 4,000; Olathe, 750; and Delta, 2,700.

The irrigation plan provides for the diversion of water from the Gunnison River by means of the Gunnison Tunnel, 6 miles long, and the South Canal, 11.7 miles long, to supplement the flow of the Uncompahgre River for the irrigation of lands in the Uncompahgre Valley. To distribute the waters of the Uncompahgre and Gunnison Rivers thus combined, the more important private canals taking water from the Uncompahgre River have been purchased, enlarged, and extended by the Government, and in addition high-line lateral systems have been constructed on each side of the valley.

The irrigation season extends from April 1 to October 31, 214 days, in all Government canals except the Loutsenhizer, under which the season extends to November 15.

The average elevation of the irrigable area is 5,500 feet above sea level; the average annual precipitation on the project for 20 years, 9.63 inches; and the range of temperature, -25° to 98° F. For 1921 at Montrose, 2° to 97°.

The soils of the irrigable area are red sandy, gravel, adobe, and clay loams. The principal products are alfalfa, grain, fruits, sugar beets, potatoes, and other vegetables. The principal markets are Denver, Omaha, and Kansas City for live stock; Denver, Missouri River points, and Texas for fruit, potatoes, and onions.

The project is completed with the exception of the acquisition of a few private laterals.

### SUMMARY OF DATA FOR UNCOMPAHGRE PROJECT TO END OF FISCAL YEAR 1922.

#### Areas and crops:

Irrigable acreage when project is complete.....	97,410
Public land entered to June 30, 1922.....	19,687
Public land open to entry on June 30, 1922.....	1,094
Public land withdrawn on June 30, 1922.....	799
Private land, June 30, 1922.....	75,830
Acreage service could supply, season of 1921.....	97,410
Acreage irrigated, season of 1921.....	63,760
Acreage cropped under irrigation, season of 1921.....	63,600
Value of irrigated crops, season of 1921.....	\$2,614,300
Value of irrigated crops per acre cropped.....	\$41.10

#### Finances:

##### Appropriations—

Fiscal year 1922; all Congressional authorizations.....	\$363,402.76
Encumbrances; disbursements and liabilities.....	154,762.70

Unencumbered balance July 1, 1922.....	\$208,640.06
Fiscal year 1923; amount specified in appropriation act.....	215,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$32,443.97	\$6,667,183.45
<b>Less—</b>		
Loss <sup>1</sup> .....		47,370.81
Water-right contracts, project land (97,410 acres).....	6,713,584.50	6,713,584.50
<b>Total.....</b>	6,713,584.50	6,760,955.31
<b>Balance.....</b>	*6,681,140.53	*63,771.86

<sup>1</sup> Contract with Uncompahgre Valley Water Users' Association dated May 7, 1918.

\* Contra.

	Reclamation fund.	Increase of compensation.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$7,910,905.76	\$80,409.79	\$7,991,315.55
Less collections.....	1,308,116.33		1,308,116.33
<b>Net investment.....</b>	6,602,789.43	80,409.79	6,683,199.22

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges .....	\$933. 80	\$933. 80	\$933. 80	\$933. 80	.....	.....
Water-right charges advanced .....	.....	.....	.....	1,775. 00	73,162. 17	.....
Revenues:						
Rentals of irrigating water .....	131,617. 52	1,172,244.13	133,034. 79	1,063,222. 22	.....	89,021. 91
Rentals of grazing and farming lands .....	25. 00	107. 00	25. 00	107. 00	.....	.....
Total .....	131,642. 52	1,172,351.13	133,059. 79	1,063,329. 22	.....	89,021. 91
Miscellaneous uncollected .....	.....	.....	.....	.....	.....	201. 78
Other miscellaneous collections .....	.....	.....	2,796. 20	222,078. 31	.....	.....
Grand total collections .....	.....	.....	126,789. 79	1,308,116. 33	.....	.....

**ACTIVITIES DURING FISCAL YEAR.**

The principal construction work consisted in the enlargement, and installation of minor structures on formerly private laterals taken over by the Government.

During the season of 1921 the service supplied and distributed water for the irrigation of 63,759 acres of land, of which 5,361 acres were supplied from the South lateral system; 5,040 acres from the West lateral system; 19,872 acres from the Montrose & Delta lateral system; 5,401 acres from the Loutsenhizer lateral system; 6,589 acres from the Selig lateral system; 15,070 acres from the Ironstone lateral system; 4,874 acres from the East lateral system; and 1,552 acres from the Garnet lateral system.

During the year 446,225 acre feet of water were diverted into the canals operated by the service and 415,599 acre-feet were delivered to 1,639 farms.

Heavy rains during the latter part of the irrigation season of 1921 did considerable damage in local drainage areas of the project, but did not seriously interfere with the delivery of water.

Extensive repairs were made during the winter of 1921-22 to the headworks of the Montrose and Delta and Selig Canals, made necessary by the damaging floods of June, 1921.

Routine maintenance work consisted of brushing canal banks, removing weeds after windstorms, spading banks, removing gravel from headworks, repairing and raising banks, and replacing structures.

A disastrous slide occurred on May 25 on the side hill where the Montrose & Delta Canal reaches the top of Spring Creek Mesa. After an attempt of several days to raise the sliding ditch bank and maintain an uninterrupted flow of water, the slide had reached such proportions that it became necessary to excavate the ditch section farther back into the hill for a substantial foundation and build a bench flume. The flume as constructed is 528 feet long, 23 feet 6 inches in depth, and has a capacity of 500 second-feet.

*Operation data, Uncompahgre project, by calendar years.*

	1917	1918	1919	1920	1921
Average for which service was prepared to supply water.....	90,000	100,000	100,000	100,000	<sup>1</sup> 97,410
Average irrigated.....	53,108	58,270	60,908	64,180	63,760
Miles of canal operated.....	415	413	442	448	452
Water diverted (acre-feet).....	368,148	423,050	420,176	420,820	446,226
Water delivered to land (acre-feet).....	316,365	367,144	390,770	366,868	415,599
Per acre of land irrigated (acre-feet).....	6.98	6.30	6.42	6.70	6.82

<sup>1</sup> Decrease due to reclassification.

**CROPS AND SETTLEMENT.**

All crops made a smaller return per acre than in 1920, with the exception of onions and beans. The onion average per acre was the highest in the history of the project. The yield from the alfalfa crop suffered on account of rainy periods during June and July. The apple crop decreased in yield as the fruit did not set well on account of the heavy production of the previous year. The year was favorable for wheat and sugar beets. The potato decrease was due to diseased seed, a dry year for germination, and a hot wet summer. The usual difficulty was experienced in obtaining suitable cars for the shipment of crops from the project.

*Settlement data, Uncompahgre project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	1,402	1,514	1,526	1,588	1,639
Population.....	4,613	5,279	5,471	6,015	6,166
Number of irrigated farms.....	1,402	1,514	1,526	1,588	1,639
Operated by owners or managers.....	809	949	1,012	1,077	941
Operated by tenants.....	593	565	514	511	698
Population.....	4,613	5,279	5,471	6,015	6,166
Number of towns.....	3	3	3	3	3
Population.....	6,950	6,950	6,950	7,450	7,450
Total population in towns and farms.....	11,563	12,229	12,421	13,465	13,616
Number of public schools.....	26	26	27	27	27
Number of churches.....	27	27	27	27	27
Number of banks.....	8	8	8	8	8
Total capital stock.....	\$515,700	\$588,800	\$594,025	\$621,763	\$618,250
Amount of deposits.....	\$4,858,903	\$4,484,626	\$5,550,465	\$4,925,150	\$3,219,773
Number of depositors.....	9,500	10,000	11,000	11,000	11,000



## IDAHO, BOISE PROJECT.

J. B. BOND, project manager, Boise, Idaho.

The Boise project is located in the counties of Ada, Boise, Canyon, and Elmore, Idaho; and Malheur, Oreg. It is served by the Oregon Short Line Railroad and branch lines; also the Idaho Traction and Caldwell Traction Co. electric lines. The length of the irrigation season is 184 days from April 5. The average elevation of the irrigable area is 2,500 feet above sea level. The rainfall at Boise for 58 years averaged 13.67 inches. The greater part of this precipitation occurs outside of the growing season. The average highest recorded temperature for 23 years is 102° F. and the average lowest temperature for the same period is 3° F. The character of the soil is clayey loam, light sandy loam, and sandy loam. The principal products are alfalfa, wheat, oats, clover, potatoes, apples, prunes, and head lettuce. The principal markets are Boise, Nampa, Caldwell, and Meridian, Idaho; Portland, Oreg.; and eastern cities. The limiting area of farm units on public land is 80 acres and on private land 160 acres.

The irrigation plan provides for storage of water in the Arrowrock Reservoir on Boise River, about 22 miles above Boise, and in the Deer Flat Reservoir near Caldwell and Nampa, Idaho; the diversion of water from Boise River by the Boise River Dam, about 8 miles above Boise; the distribution of water on the south side of Boise River, through the Main Canal, leading from the dam to the Deer Flat Reservoir; distributing laterals heading in the Main Canal; distributing canals heading in the Deer Flat Reservoir; and distributing canal systems heading in the Boise River below the Boise River Dam; and the distribution of water on the north side of the Boise River to a small area of land east of Boise through a canal system heading in the Boise River Dam. Water is diverted from two large drains in the Pioneer irrigation district and carried through a gravity canal across the Boise River near Caldwell to supply 6,500 acres in the Notus division.

### SUMMARY OF DATA FOR BOISE PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		1 353,600
Public land entered to June 30, 1922.....	67,468	
Public land withdrawn on June 30, 1922.....	5,560	
State land unsold on June 30, 1922.....	5,980	
Private land, June 30, 1922.....	274,592	
Acreage service could supply, season of 1921.....		* 282,831
Acreage irrigated, season of 1921 (crop census).....		111,500
Acreage cropped, season of 1921 (crop census).....		103,340
Value of irrigated crops, season of 1921.....	\$4,208,940.00	
Value of irrigated crops per acre cropped.....		\$40.68
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922; all congressional authorizations.....	\$1,823,108.44	
Encumbrances, disbursements and liabilities.....	363,284.01	
Unencumbered balance July 1, 1922.....		\$1,459,824.43
Fiscal year 1923, amount specified in appropriation act.....		1,220,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$21,378.12	\$12,425,780.97
<b>Less water-right contracts—</b>		
Project lands, 96,050 acres.....	* 216,665.25	7,450,242.51
Warren Act lands, approximately 163,119 acres.....	496,778.06	4,876,347.99
Total.....	280,112.81	12,326,590.50
Balance.....	* 258,734.69	99,190.47

\* Contra.

<sup>1</sup> Including proposed extensions.

<sup>2</sup> Including partial service to vested water-right land.

## Summary of data for Boise project to end of fiscal year 1922—Continued.

	Calendar year 1921.	To Dec. 31, 1921.	Fiscal year 1922.	To June 30, 1922.
Net operation and maintenance cost (regular).....	\$327,437.27	\$1,180,464.68	\$308,971.54	\$1,807,078.89
Less—				
Charges billed or contracted.....	334,738.18	1,201,981.15	351,005.60	1,219,655.79
Penalties and discounts (net).....	* 8,025.54	* 21,552.86	* 3,785.30	* 25,121.59
Total.....	326,712.64	1,180,428.29	347,220.30	1,194,534.20
Balance.....	724.63	36.39	* 38,248.76	112,544.69
Net operation and maintenance cost (drainage).....	33,895.12	33,895.12	55,213.96	64,346.45
Less—				
Charges billed or contracted.....	93,428.01	93,428.01	153,556.06	200,205.33
Penalties and discounts (net).....	* 1,252.21	* 1,252.21	* 400.43	* 1,242.17
Total.....	92,175.80	92,175.80	153,155.63	198,963.16
Balance.....	* 58,280.68	* 58,280.68	* 97,941.67	* 134,616.71
	Reclamation fund.	Judgments, Court of Claims.	Increase of compensa- tion.	Total.
Investment to date:				
Disbursements and net transfers.....	\$15,025,110.30	\$50,228.93	\$149,838.92	\$15,225,178.05
Less collections.....	3,550,523.25			3,550,523.25
Net investment.....	11,474,586.95	50,228.93	149,838.92	11,674,654.80

\* Contra.

## Status of current accounts receivable as of June 30, 1922.

	Due.		Collected.			Uncol- lected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost: Water-right charges.....	\$379,026.78	\$1,307,579.18	\$215,272.42	\$1,086,746.04	\$25,092.00	\$195,741.14
Construction water-right charges paid in advance.....				9,377.08		
To return net operation and maintenance cost (regular): Operation and maintenance charges—						
Project lands, 96,972 acres.....	206,367.95	718,601.74	153,548.50	576,068.89	21,482.98	116,049.87
Warren Act lands (ap- proximately 61,319 acres).....	131,214.91	455,938.65	98,106.12	368,065.36	13,726.03	74,147.27
Other lands (approx- imately 6,740 acres)....	14,422.74	50,115.40	10,783.52	40,456.68	1,806.72	8,150.04
Penalties and interest.....	4,685.72	11,596.14	4,685.72	11,596.14		
Total.....	355,691.32	1,231,251.93	267,123.86	996,187.02	36,717.73	198,347.18
To return net operation and maintenance cost (drainage): Drainage charges project lands (136,227 acres).....	153,556.06	200,206.33	47,335.07	67,002.51	2,061.05	131,151.77
Penalties and interest.....	808.88	808.88	808.88	808.88		
	154,364.94	201,014.21	48,143.95	67,811.39	2,061.05	131,151.77
Operation and maintenance charges paid in advance.....				17.14		
Revenues:						
Rentals of irrigating water..	15,160.33	721,247.21	11,193.17	705,410.71	4,720.50	11,116.00
Rentals of power and light.	12,500.33	106,327.60	7.00	96,424.61	9,902.99	
Rentals of grazing and farming lands.....	*458.84	20,403.31	1,148.38	20,292.71		110.63
Total.....	27,201.82	847,978.15	12,348.55	822,128.03	14,623.49	11,226.63
Miscellaneous uncollected.						6,554.63
Other miscellaneous collections.			32,662.05	588,256.55		
Grand total collections.....			575,450.53	3,550,523.25		

\* Contra.

## ACTIVITIES DURING FISCAL YEAR.

In the Arrowrock division construction consisted of placing structures necessary to the taking over of New York laterals as provided in the contract between the United States and the New York Canal Co. In the Notus division 15 timber tap boxes and 15 timber weirs were placed in order to complete the distribution system. Construction of the Riverside and Big Bend drainage was completed. The drainage organization was moved to Wilder and work was continued on drainage. About 5 miles of deep drains were completed involving 225,000 cubic yards of class 1 excavation, the placing of 40 cubic yards of concrete, and 16,950 feet b. m. of lumber.

During 1921 561,308 acre-feet of water were delivered to 2,686 farms containing an irrigated area of 153,000 acres. The average amount of water used was 3.67 acre-feet at an average cost of \$2.19 per acre for operation and maintenance.

The right of the United States to divert water from the natural flow of the Boise River terminated for the season of 1921 on July 24. The full storage capacity of Arrowrock Reservoir was available on May 18, the first stored water being used on July 7. Deer Flat Reservoir was completely filled on April 12 and its storage capacity maintained until well into the irrigation season. The average seepage loss in Deer Flat Reservoir was 5.7 acre-feet per acre submerged as compared with 7.5 for 1920.

Under terms of permanent contracts water was released from Arrowrock Reservoir to supplement the vested rights of the Nampa and Meridian irrigation district, Pioneer irrigation district, Settlers Canal Co., Farmers Union Ditch Co., Farmers Cooperative Ditch Co., and the New York Canal Co.

Under a contract with the Black Canyon irrigation district the United States operated the Notus Canal during the season of 1921. At the close of the irrigation season the Notus division was turned over to the district for operation and maintenance.

*Maintenance.*—During the year 270 small structures were replaced and 197 new structures installed. The Richards Point wasteway was completed and successfully operated during the year. On the Deer Flat Low Line Canal concrete lining was placed at badly eroded sections amounting to 239 cubic yards. At other points on the same canal gravel riprap was placed amounting to 3,483 linear feet. A number of steel flumes were given a coat of paint before the opening of the irrigation season. At Arrowrock Dam maintenance consisted of a retaining wall along the driveway, repairs to the superintendent's house and other buildings besides repairs to the road across Deer Creek.

*Operation data, Boise project, Idaho, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage to which Service was prepared to furnish water.....	<sup>1</sup> 223,866	<sup>1</sup> 223,866	<sup>1</sup> 274,339	<sup>1</sup> 274,125	<sup>1</sup> 274,379	<sup>1</sup> 282,831
Acreage irrigated.....	<sup>1</sup> 101,315	<sup>1</sup> 95,524	<sup>1</sup> 110,000	<sup>1</sup> 125,000	<sup>1</sup> 131,760	<sup>1</sup> 153,000
Miles of canal operated.....	980	982	988	989	1,000	1,016
Water diverted (acre-feet).....	656,854	618,272	824,462	759,064	853,810	844,195
Water delivered to land per acre of land irrigated (acre-feet).....	3.56	3.07	3.75	3.34	3.60	3.67

<sup>1</sup> Including partial service to vested water-rights land.

<sup>2</sup> 111,500 covered by crop census.

<sup>2</sup> Acreage served with full water supply.

*Settlement data, Boise project.*

Item.	1917	1918 *	1919	1920	1921
Total number of farms on project .....	3,932	3,992	3,992	4,000	4,085
Population .....	12,580	13,200	15,000	16,000	16,340
Number of irrigated farms .....	2,780	3,060	3,207	3,260	3,300
Operated by owners or managers .....	1,900	2,090	2,545	2,417	2,440
Operated by tenants .....	880	970	662	843	860
Population .....	8,340	9,170	10,000	11,176	11,550
Number of towns .....	10	10	10	10	8
Population .....	34,750	36,000	40,000	36,400	36,170
Total population in towns and on farms .....	47,330	49,200	55,000	52,400	52,510
Number of public schools .....	23	24	24	24	23
Number of churches .....	52	52	54	56	56
Number of banks .....	15	15	15	17	16
Total capital stock .....	\$1,800,000	\$1,800,000	\$2,000,000	\$1,850,000	\$2,741,000
Amount of deposits .....	\$11,500,000	\$11,500,000	\$13,500,000	\$20,600,000	\$16,328,000
Number of depositors .....	<sup>1</sup> 25,000	<sup>1</sup> 25,000	<sup>1</sup> 28,000	<sup>1</sup> 32,000	<sup>1</sup> 30,000

<sup>1</sup> Estimated; some banks refuse to give number of depositors.

# IDAHO, KING HILL PROJECT.

WALTER WARD, project manager, King Hill, Idaho.

The King Hill project is located in the counties of Elmore, Gooding, Owyhee, and Twin Falls. The estimated population of the four project towns is as follows: Glenns Ferry, 1,225; Bliss, 200; King Hill, 180; Hammett, 80. The Oregon Short Line runs the entire length of the project. The water supply is obtained from the Malad River. The average elevation of the irrigable land is 2,750 feet above sea level. During the past 10 years the average rainfall was 9.2 inches, the average maximum temperature 107° F., and the average minimum temperature 4° F. The soil ranges from light to heavy sandy loam with some heavy clay. With an irrigation season of 193 days the project produces principally alfalfa, early vegetables, grain, and stock. These find a ready market at Portland, Boise, and small towns in southern Idaho.

## SUMMARY OF DATA FOR KING HILL PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....	16,978	
Public land entered to June 30, 1922.....	518	
Public land open to entry on June 30, 1922.....	119	
State land unsold on June 30, 1922.....	370	
Private land, June 30, 1922.....	15,971	
Acreage service could supply, season of 1921.....	13,648	
Acreage irrigated, season of 1921.....	5,900	
Acreage cropped under irrigation, season of 1921.....	5,390	
Value of irrigated crops, season of 1921.....	\$119,210.00	
Value of irrigated crops per acre cropped.....	\$22.20	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$340,807.85	
Encumbrances, disbursements, and liabilities.....	280,161.88	
Unencumbered balance July 1, 1922.....	\$60,645.97	
Fiscal year 1923, amount specified in appropriation act.....	450,000.00	

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$261,178.80	\$1,471,624.46
Less water-right contracts, project lands (16,978 acres).....		2,000,000.00
Balance.....	261,178.80	* 528,375.54

	Reclamation fund.	Increase of compensa- tion.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$1,523,541.60	\$91,498.11	\$1,615,039.71
Less collections.....	67,760.55		67,760.55
Net investment.....	1,455,781.05	91,498.11	1,547,279.16

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected, cash.		Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	
To return net construction cost, water- right charges.....	\$76,752.20	\$76,752.20			\$76,752.20
Revenues, rentals of irrigating water.....	19,692.71	23,504.49	\$19,578.79	\$23,390.57	113.92
Miscellaneous uncollected.....			9,978.19	44,369.98	483.86
Other miscellaneous collections.....					
Grand total collections.....			29,556.98	67,760.55	

## ACTIVITIES DURING FISCAL YEAR.

Construction consisted of the building of two concrete flumes, several lock-joint siphons, one wood-stave flume, and a number of earth laterals.

The two concrete flumes are of the continuous type and have a width of 6 feet, and are 3.5 feet high. Walls and floors are  $4\frac{1}{2}$  inches thick. The Slick flume is 7,510 feet long and the Cold Springs flume is 8,080 feet long.

Below is a list of the lock-joint pipe siphons with the diameter and length of each.

	Diameter.	Length.
	Inches.	Feet.
Camas Road siphon.....	54	193.6
Slick siphon No. 1.....	54	240.2
Slick siphon No. 2.....	54	273.5
Little Alkali siphon.....	48	159.0
Hammett siphon.....	24	4,042.0
King Hill siphon.....	27	1,360.0
Do.....	21	2,268.0

Besides the above, 91 feet of 48-inch lockjoint pipe were placed in the Glenss Ferry siphon. The King Hill and Hammett siphons are part of the lateral system, while the others are in the main canal system.

A semicircular wood-stave flume 6.8 feet in diameter and 530 feet long, on timber trestle, was built across Big Alkali Creek. Two short stretches of earth canal were built to replace short timber flumes.

Ten thousand seven hundred and sixty lineal feet of earth laterals, having a capacity of less than 50 second-feet, were built.

## OPERATION AND MAINTENANCE.

A maintenance crew was kept busy installing new turnouts and weirs, replacing old ones, and in clearing weeds and moss from the canals and laterals. On July 11, 1921, service was discontinued below the inlet to Cold Springs flume, and on August 17 service was discontinued below the inlet to the Slick flume to allow construction work to proceed. All service was discontinued on October 1.

Between October 1, 1921, and April 1, 1922, all earth canals were cleaned and timber structures were repaired in preparation for the irrigation season of 1922.

On April 1, water was turned into the Main Canal, but deliveries did not commence until April 22.

*Operation data, King Hill project, by calendar years.*

Item.	1920	1921
Acreage for which service was prepared to supply water.....	11,340	13,648
Acreage irrigated.....	4,780	5,900
Miles of canal operated.....	83.2	83.2
Water diverted (acre-feet).....	43,660	56,153
Water delivered to land (acre-feet).....	22,420	30,028
Per acre of land irrigated (acre-feet).....	4.69	5.08

*Settlement data, King Hill project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	225	225	225	225	260
Population.....	350	350	350	424	557
Total irrigated farms.....	125	125	125	125	160
Operated by owners or managers.....	110	110	110	110	141
Operated by tenants.....	15	15	15	15	19
Number of towns.....	3	3	3	4	4
Population.....	1,350	1,425	1,500	1,572	1,685
Total population of towns and farms.....	1,700	1,775	1,850	1,974	2,242
Number of public schools.....	4	4	4	5	6
Number of churches.....	4	4	5	5	5
Number of banks.....	1	1	1	2	2
Total capital stock.....	\$20,000	\$20,000	\$20,000	\$30,000	\$30,000
Amount of deposits.....		\$183,436	\$245,545	\$418,548	\$319,036
Number of depositors.....		758	738	1,060	824

# IDAHO, MINIDOKA PROJECT.

BARRY DIBBLE, project manager, Burley, Idaho.

The project is located in Minidoka and Cassia Counties, Idaho; Jackson Lake Reservoir is in Lincoln County, Wyo. The only railroad is the Oregon Short Line. Project towns and estimated population are Burley, 5,000; Rupert, 2,500; Paul, 600; Declo, 300; Heyburn, 300; and Acequia, 50. The source of water supply is Snake River, supplemented by storage. The irrigation season is from April 1 to October 15 (198 days); average rainfall for the past 17 years, 11.9 inches; average of maximum and minimum temperatures for the past 17 years, 99° and -13.1° F. The principal products are alfalfa, wheat, oats, clover seed, sugar beets, and potatoes.

The project is watered by two canal systems, one on either side of Snake River. Power developed at the diversion dam is used in pumping water from the canals for irrigating high lands, and is also used for municipal and domestic purposes. Storage for the project is provided by a reservoir at Jackson Lake, Wyo., with a total capacity of 847,000 acre-feet, and by Lake Walcott, at the upper end of the project, with an available capacity of 100,000 acre-feet.

## SUMMARY OF DATA FOR MINIDOKA PROJECT TO END OF FISCAL YEAR 1922.

### Areas and crops:

Irrigable acreage when project is complete.....		
Public land entered to June 30, 1922.....	90,357	
Public land open to entry on June 30, 1922.....	343	
State land unsold on June 30, 1922.....	28	
Private land entered to June 30, 1922.....	24,829	
Acreage service could supply, season 1921.....		121,557
Acreage irrigated, season of 1921.....		107,230
Acreage cropped under irrigation, season of 1921.....		100,720
Value of irrigated crops, season of 1921.....		\$3,409,280
Value of irrigated crops per acre cropped.....		\$33.85

### Finances:

Appropriations—		
Fiscal year 1922, all congressional authorizations.....	\$2,523,015.03	
Encumbrances, disbursements, and liabilities.....	335,933.42	
Unencumbered balance July 1, 1922.....		\$2,187,081.61
Fiscal year 1923, amount specified in appropriation act.....		1,200,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$33,331.29	6,846,239.87
Less—			
Funds advanced for construction.....			832,527.96
Water-right contracts—			
Project lands (120,625 acres).....	\$965.25		5,646,577.40
Warren Act lands (approximately 603,840 acres).....			429,412.50
Other lands.....			7,500.00
Total.....		\$965.25	6,916,017.86
Balance.....		64,296.54	\$69,777.99
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$144,893.25	\$1,206,670.84	\$115,339.98
Less—			
Charges billed or contracted.....	149,181.63	1,223,144.74	147,963.10
Penalties and discounts (net).....	1,596.58	\$5,284.43	7,144.20
Total.....	150,748.21	1,228,880.31	155,107.30
Balance.....	\$5,854.96	\$26,289.97	\$39,787.37
			\$14,254.50

\* Contra.



*Summary of data for Minidoka project to end of fiscal year 1922—Continued.*

	Reclamation Fund.	Judgments Court of Claims.	Increase of compensation.	Total.
Investment to date:				
Disbursements and net transfers.....	\$8,884,238.18	\$15,550.90	\$91,087.16	\$8,990,876.24
Less collections.....	4,340,730.94			4,340,730.94
Net investment.....	4,543,507.24	15,550.90	91,087.16	4,650,145.30

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost: Funds advanced..... Water-right charges.....		\$832, 527. 96 1, 738, 063. 95		\$832, 527. 96 1, 398, 580. 42	\$158, 706. 69	\$185, 756. 84
Total.....	271, 881. 91	2, 570, 581. 91	218, 128. 01	2, 231, 118. 38	158, 706. 69	185, 756. 84
Construction water-right charges paid in advance.....				1, 879. 75		
To return net operation and maintenance cost: Operation and mainte- nance charges— Project lands (120,625 acres)..... Warren Act lands (ap- proximately 603,840 acres)..... Penalties and interest.....						
	135, 146. 13	1, 131, 749. 65	159, 766. 57	916, 540. 39	66, 671. 75	148, 537. 51
	12, 816. 97	83, 204. 10	13, 025. 45	83, 026. 84		177. 26
	8, 354. 02	16, 902. 91	8, 354. 02	16, 902. 91		
Total.....	156, 317. 12	1, 231, 856. 66	181, 146. 04	1, 016, 470. 14	66, 671. 75	148, 714. 77
Operation and maintenance charges paid in advance.....				7. 82		
Revenues: Rentals of irrigating water.. Rentals of power and light.. Rentals of grazing and farming lands.....						
	5, 721. 80	267, 887. 04	5, 721. 80	264, 652. 81	3, 234. 23	
	116, 098. 88	580, 524. 84	120, 397. 52	551, 996. 88	4, 806. 13	23, 751. 63
	1, 879. 22	33, 945. 69	478. 27	28, 705. 27		5, 240. 42
Total.....	124, 299. 91	882, 357. 57	126, 597. 59	845, 324. 96	8, 040. 36	28, 992. 25
Miscellaneous uncollected.....						1, 757. 43
Other miscellaneous collections.....			44, 700. 75	245, 929. 89		
Grand total collections.....			570, 572. 39	4, 340, 730. 94		

**ACTIVITIES DURING FISCAL YEAR.**

*North Side pumping division.*—Topographic surveys were completed covering 154,378 acres. Some studies and estimates of cost were also made.

*American Falls Reservoir.*—Work in connection with the reservoir was greatly reduced owing to shortage of funds. Most of the canal companies that had subscribed for water in the reservoir failed to pay the money due under their contracts. A plan was advanced by the Idaho Reclamation Association for forming a large irrigation district to include the lands of several companies. At the end of the year the petition for the organization of the American Falls Reservoir district had been signed by 1,388 persons, owning 142,000 acres of the 500,000 included in the district. The petition was filed with the county clerk of Twin Falls County on July 1, 1922.

**Commercial power.**—The capacity of the Rupert substation was increased from 1,500 to 2,100 kilovolt amperes.

**Operation.**—Water was turned out of the Main North Side Canal on October 12, 1921, and turned into the canal on March 15, 1922. Total diversions into this canal were 457,625 acre-feet in 1921. Drain discharges during the year were 89,645 acre-feet. The South Side Canal diverted 246,304 acre-feet, of which 180,508 acre-feet were pumped. The South Side pumping stations were shut down on October 14, 1921, and started again on May 7, 1922.

Jackson Lake reservoir was filled in 1921, for the first time, to its maximum of 847,000 acre-feet. Storage water was released on July 1, 1921, and at the end of the season 151,340 acre-feet remained in the reservoir. In 1922 the reservoir was again filled to capacity.

*Operation data, Minidoka project, by calendar years.*

	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	120,300	120,859	121,000	121,292	121,557	121,557
Acreage irrigated.....	89,900	99,020	105,062	104,259	107,650	107,230
Miles of canal operated.....	615	638.19	634.37	634.60	634.60	634.60
Water diverted (acre-feet).....	640,432	616,228	745,821	626,645	734,428	703,929
Water delivered to land (acre-feet).....	334,649	308,273	390,903	349,012	388,766	<sup>1</sup> 99,363
Per acre of land irrigated (acre-feet) <sup>1</sup> .....	3.7	3.1	3.7	3.3	3.6	<sup>1</sup> 2.13

<sup>1</sup> Partially estimated.

<sup>2</sup> South Side pumping division; data from Gravity division not available.

*Settlement data, Minidoka project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	2,322	2,327	2,340	2,353	2,420	2,454
Population.....	6,468	7,467	8,490	9,029	9,177	8,848
Number of irrigated farms.....	1,760	2,195	2,208	2,353	2,420	2,454
Operated by owners or managers.....	1,352	1,725	1,556	1,877	1,863	1,987
Operated by tenants.....	408	470	662	476	557	467
Population.....	5,800	7,467	8,490	9,029	9,230	8,848
Number of towns.....	5	6	6	6	6	6
Population.....	4,100	5,300	6,600	8,500	9,000	8,445
Total population towns and farms.....	10,568	12,767	15,090	17,529	18,250	17,293
Number of public schools.....	21	30	21	28	26	22
Number of churches.....	21	25	25	25	29	29
Number of banks.....	6	6	8	8	10	16
Total capital stock.....	\$140,000	\$165,000	\$240,000	\$260,000	\$345,000	<sup>1</sup> \$190,000
Amount of deposits.....	\$1,311,641	\$2,522,764	\$2,543,343	\$3,725,691	\$3,860,744	<sup>1</sup> \$1,140,000
Number of depositors.....	6,370	7,350	10,663	11,086	12,725	<sup>1</sup> 5,800

<sup>1</sup> Exclusive of banks that failed.

# MONTANA, HUNTLEY PROJECT.

A. R. MCGINNESS, project manager, Ballantine, Mont.

The Huntley project is located in the south central part of Montana, Yellowstone County, and is tributary to the Northern Pacific and the Chicago Burlington & Quincy Railroads. There are four prosperous towns on the project—Huntley, Worden, Ballantine, and Pompeys Pillar—which provide excellent commercial facilities to all part thereof. The entire project is practically completed, and water may be delivered to all lands from the present system. The irrigation plan provides for the diversion of water from the Yellowstone River at a point 2 miles west of Huntley and for a gravity supply to all project lands except 5,400 acres under the high-line canal and its extensions, which are served by two pumping plants located 1½ miles east of Ballantine. These pumping plants elevate a maximum of 106 second-feet up a 45-foot lift into the high-line canal. The water supply for the project is ample and is derived direct from the Yellowstone River without diversion dam or storage works.

The soils consist of heavy clays and light sandy loams, lying at an average elevation of about 3,000 feet above sea level. Climatic conditions are favorable to the production of staple crops. The average annual rainfall is 12 to 13 inches.

## SUMMARY OF DATA FOR HUNTLEY PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>			
Irrigable acreage when project is complete.....			32,71
Public land entered to June 30, 1922.....	26,286		
Public land withdrawn on June 30, 1922.....	2,526		
Private land entered to June 30, 1922.....	3,906		
Acreage service could supply, season of 1921.....			31,98
Acreage irrigated, season of 1921.....			18,8
Acreage cropped under irrigation, season of 1921.....			18,4
Value of irrigated crops, season of 1921.....			\$440,7
Value of irrigated crops per acre cropped.....			\$23.7
<b>Finances:</b>			
Appropriations—			
Fiscal year 1922, all congressional authorizations.....	\$210,192.82		
Encumbrances, disbursements and liabilities.....	50,388.53		
Unencumbered balance July 1, 1922.....			\$159,804.2
Fiscal year 1923, amount specified in appropriation act.....			170,000.0

		Fiscal year 1922.	To June 30 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$18,248.41	\$1,467,685.1
Less—			
Funds advanced and unapplied cooperative credits.....			717.6
Water-right contracts, project lands (28,160 acres).....		\$8,206.30	1,324,280.4
Total.....		\$8,206.30	1,324,998.0
Balance.....		26,456.71	142,687.0
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$58,299.43	\$789,976.64	40,064.53
Less—			
Charges billed or contracted.....	68,020.41	378,871.88	67,978.37
Penalties and discounts (net).....	*797.53	*1,718.89	*67.12
Total.....	67,222.88	377,152.99	*67,911.25
Balance.....	*8,923.45	412,823.65	*27,846.72
			434,185.4
		Reclamation fund.	Increase of compensation.
Investment to date:			Total.
Disbursements and net transfers.....		\$2,353,804.13	\$2,381,139.1
Less collections.....		707,770.58	707,770.5
Net investment.....		1,645,833.55	27,535.71
			1,673,369.5

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
Return net construction cost:						
Funds advanced		\$717. 64		\$717. 64		
Water-right charges	\$26,000. 11	366,400. 79	\$13,937. 96	344,589. 81	\$339. 40	\$21,471. 58
Total	26,000. 11	367,118. 43	13,937. 96	345,307. 45	339. 40	21,471. 58
Construction water-right charges paid in advance				1,487. 18		
Return net operation and maintenance cost:						
Operation and maintenance charges, project lands (28,160 acres)	67,900. 88	378,260. 08	23,771. 81	281,955. 41	6,699. 35	80,615. 33
Penalties and interest	622. 30	4,015. 41	622. 30	4,015. 41		
Total	68,523. 18	382,275. 49	24,394. 11	285,970. 82	6,699. 35	80,615. 33
Operation and maintenance charges paid in advance				42. 84		
Revenues:						
Rentals of irrigating water.	431. 99	5,159. 27	343. 81	5,071. 09		88. 18
Rentals of grazing and farm- ing lands	892. 11	11,362. 88	1,635. 58	10,398. 46		964. 42
Total	1,324. 10	16,522. 15	1,979. 39	15,469. 55		1,052. 60
Miscellaneous uncollected.						73. 00
Other miscellaneous collections.			1,826. 89	59,492. 74		
Grand total collections...			42,138. 35	707,770. 58		

**ACTIVITIES DURING FISCAL YEAR.***Operation data, Huntley project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acres for which service was prepared to deliver water	32,271	32,271	31,360	31,265	32,085	31,964
Acres irrigated	18,635	19,122	19,262	19,310	20,020	18,800
Miles canal operated	210	229	229	229	229	229
Water diverted (acre-feet)	67,873	64,344	47,982	92,638	79,079	79,186
Water delivered to land (acre-feet)	21,123	21,274	20,182	31,785	24,250	26,814
Per acre land irrigated (acre-feet)	1.13	1.11	1.06	1.64	1.21	1.42

*Settlement data, Huntley project.*

Item.	1916	1917	1918	1919	1920	1921
Total number farms on the project	691	691	691	691	691	691
Number of irrigated farms	550	553	551	549	603	578
Operated by owners or managers	400	368	359	315	320	377
Operated by tenants	150	185	202	234	283	201
Population	2,050	1,880	2,107	2,000	1,883	1,861
Number of towns	8	8	8	8	8	8
Population	468	610	599	599	604	673
Total population in towns and on farms	2,518	2,490	2,706	2,599	2,547	2,534
Number of public schools	8	8	8	8	8	8
Number of churches	6	6	6	6	6	7
Number of banks	3	4	4	4	4	4
Total capital stock	\$60,000	\$85,000	\$85,000	\$85,000	\$95,000	\$95,000
Amount of deposits	\$307,414	\$498,000	\$540,434	\$560,000	\$588,382	\$402,282
Number of depositors	1,180	1,375	1,400	1,400	1,711	1,476

## MONTANA, MILK RIVER PROJECT.

G. E. STRATTON, project manager, Malta, Mont.

R. M. SNELL, project manager, St. Mary Storage, Browning, Mont.

The irrigable area comprises a strip of 160,208 acres of Milk River bottom land, with a maximum width of about 3 miles and a length of 150 miles, traversed from end to end by the Great Northern Railway and lying between Chinook and the mouth of the river near Glasgow. The average elevation is 2,200 feet. The average precipitation is 13.20 inches. The water supply is from natural flow and storage on both the Milk and St. Mary Rivers.

The irrigation plan provides for the storage of water in the Sherburne Lakes and its diversion through a canal 28.9 miles long, heading three-fourths of a mile below the Lower St. Mary Lake and discharging into the North Fork of Milk River, thence flowing through Canada for 216 miles and returning to the United States; the storage of water in Nelson Reservoir south of Milk River and about 20 miles northeast of Malta; a storage reservoir on Beaver Creek about 20 miles southeast of Malta; storage in Chain Lakes Reservoir, between Havre and the Canadian boundary; the discharge of stored water into Milk River as required; the diversion of water from Milk River by three or more dams near Chinook and Harlem into canals on each side of the river, for the irrigation of lands near Chinook and Harlem, comprising the Chinook division; the diversion of water from Milk River by a dam near Dodson into two canals, the North Side Canal irrigating lands near Dodson, Wagner, and Malta, and the South Side Canal conveying water to Nelson Reservoir and irrigating lands near Wagner, Malta, Bowdoin, and Ashfield; the irrigation of lands on the south side of Milk River and Beaver Creek in the vicinity of Saco and Hinsdale from the stored waters of Nelson Reservoir, comprising the Malta division; and in the Glasgow division the diversion of water at Vandalia Dam into a canal on the south side of Milk River for the irrigation of lands near Tampico, Glasgow, and Nashua. In case the normal flow of Milk River at Vandalia Dam is not sufficient for the irrigation of lands in the Glasgow division, the stored waters in Nelson Reservoir can be returned to Milk River and diverted again at Vandalia Dam.

### SUMMARY OF DATA FOR MILK RIVER PROJECT TO END OF FISCAL YEAR 1922 (INCLUDING ST. MARY STORAGE).

#### Areas and crops:

Irrigable acreage when project is complete.....	160,208
Public land entered to June 30, 1922.....	31,590
Public land withdrawn on June 30, 1922.....	19,603
State land unsold on June 30, 1922.....	6,795
Private land, June 30, 1922.....	102,220
Acreage service could supply, season of 1921.....	194,100
Acreage irrigated, season of 1921.....	242,400
Acreage cropped under irrigation, season of 1921.....	39,910
Value of irrigated crops, season of 1921.....	\$358,090
Value of irrigated crops per acre cropped.....	\$8.98

#### Finances:

Appropriations—	
Fiscal year 1922, all congressional authorizations.....	\$1,078,871.08
Encumbrances, disbursements, and liabilities.....	333,604.04
Unencumbered balance July 1, 1922.....	\$745,267.04
Fiscal year 1923, amount specified in appropriation act.....	690,000.00

	Milk River.		St. Mary storage.		Total.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Irrigation works, net construction cost.....	\$271,761.41	\$3,859,519.09	\$36,479.74	\$2,700,377.22	\$308,241.15	\$6,559,896.31

<sup>1</sup> Includes 27,727 acres on Chinook division. Reduction is due to better data on irrigable areas.

<sup>2</sup> Includes 26,000 acres on Chinook division.

<sup>3</sup> Includes 23,900 acres on Chinook division.

<sup>4</sup> Includes \$228,250 on Chinook division.

*Summary of data for Milk River project to end of fiscal year 1922 (including St. Mary storage)—Continued.*

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensation.	Totals.
Investment to date:				
Disbursements and net transfers.....	\$6,910,375.10	\$2,674.64	\$80,724.02	\$6,993,773.76
Less collections.....	311,772.23			311,772.23
Net investment.....	6,598,602.87	2,674.64	80,724.02	6,682,001.53

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
Construction water-right charges paid in advance.....				\$1,114. 00		
Revenues:						
Rentals of irrigating water.....	\$15,372. 67	\$156,469. 19	\$23,746. 65	133,539. 63	\$14. 40	\$22,915. 16
Rentals of grazing and farming lands.....	3,920. 25	23,184. 15	6,354. 71	22,483. 33	6. 00	694. 82
Total.....	19,292. 92	179,653. 34	30,101. 36	156,022. 96	20. 40	23,609. 98
Miscellaneous uncollected.....						4,766. 43
Other miscellaneous collections.....			15,133. 13	154,635. 27		
Grand total collections.....			45,239. 49	311,772. 23		

**ACTIVITIES DURING FISCAL YEAR.**

*Malta and Glasgow divisions.*—Enlargement of Nelson Reservoir from 25,000 to 66,800 acre-feet capacity was about 70 per cent completed. Work continued on lateral extensions, including numerous small structures in the vicinity of Saco and Glasgow. About 75 miles of operation and maintenance roads on main canal banks were built and the operation and maintenance office at Saco and gate-tender's quarters at Dodson Dam were completed.

*Chinook division.*—The Paradise Valley irrigation district continued construction with a reduced force on the main canal and lateral system.

*St. Mary storage, Sherburne Lakes Dam.*—Modifications were made to the lower cylinder gate by filling the space between the gate and gate frame with concrete to prevent debris from collecting in this space and interfering with the operation of the gate.

*St. Mary Canal.*—Nineteen thousand and seventy-one cubic yards of slide material were moved from the canal section with a drag-line excavator and about 2,800 linear feet of bank were rebuilt to prevent excessive leakage.

*Seepage and drainage.*—Seepage is showing on the flats below Nelson Reservoir and in small areas at a number of other points on the project mostly adjacent to main canals. The first drainage construction work was done in 1921 when 1.3 miles of open drain were constructed on the Milk River flats below Nelson Reservoir.

*Operation and maintenance.*—During the fiscal year the rainfall was comparatively large, which, together with the low market value of farm products, resulted in comparatively small use of irrigation water. In the season of 1921 about 6,190 acre-feet of water were delivered from United States Reclamation Service canals to 11,436 acres, exclusive of 26,000 on the Chinook division, for which 33,335 acre-feet, of which 5,249 were St. Mary supplemental water, were diverted at the headgates of private canals and 4,948 acres of project land irrigated by flood waters from creeks.

Ordinary maintenance included cleaning 27.5 miles of laterals and smaller canals with the Ruth dredger at a cost of \$124 per mile, and 8.5 miles of larger lateral and canals with Pawling and Harnischfeger No. 206 drag line at a cost of \$0.113 per cubic yard, or \$600 per mile. Unusual maintenance included filling a hole below Dodson Dam with field boulders and concrete blocks at a cost of about \$6,900.

Thirty-two thousand acre-feet of water were stored in Sherburne Lakes Reservoir between June 19 and July 26, 1921, and released later as it was not required for diversion to Milk River.

The St. Mary Canal was operated from May 9 to August 15; 66,460 acre-feet of water were diverted from St. Mary River and 54,920 acre-feet delivered to the North Fork of Milk River.

*Operation data, Milk River project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service is prepared to supply water.....	40,358	45,000	58,750	58,900	68,600	<sup>1</sup> 94,100
Acreage irrigated.....	5,518	11,058	24,842	25,485	24,330	<sup>1</sup> 42,400
Miles of canal operated.....	<sup>2</sup> 184	<sup>2</sup> 204	<sup>2</sup> 254	<sup>2</sup> 317	<sup>2</sup> 361	<sup>2</sup> 247
Water diverted.....	<sup>4</sup> 61,534	<sup>4</sup> 68,503	<sup>4</sup> 74,924	<sup>4</sup> 86,680	<sup>4</sup> 80,786	<sup>4</sup> 54,444
Water delivered to the land (acre-feet).....	3,700	11,195	16,900	21,500	10,460	<sup>4</sup> 6,190
Per acre of land irrigated (acre-feet).....	<sup>4</sup> 0.67	<sup>4</sup> 1.01	<sup>4</sup> 0.68	<sup>4</sup> 0.84	<sup>4</sup> 0.58	<sup>4</sup> 0.54

<sup>1</sup> Includes 27,727 acres on Chinook division. Reduction on Malta and Glasgow divisions is due to better data on irrigable areas.

<sup>2</sup> Includes 26,000 acres on Chinook division.

<sup>3</sup> Does not include Chinook division.

<sup>4</sup> Includes water for Nelson Reservoir.

<sup>5</sup> Includes water for Nelson Reservoir, but does not include 33,335 acre-feet diverted for Chinook division.

*Settlement data of irrigated district, Milk River project (exclusive of St. Mary storage.)*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	192	217	249	466	364
Population.....	580	668	757	867	816
Number of irrigated farms.....	112	184	247	280	178
Operated by owners or managers.....	77	140	186	206	134
Operated by tenants.....	35	44	61	22	44
Population.....	404	600	750	763	494
Number of towns.....	6	9	11	15	15
Population.....	5,000	6,000	6,500	7,796	7,170
Total population on farms and towns.....	5,580	6,668	7,257	8,559	7,986
Number of public schools.....	14	18	20	138	183
Number of churches.....	15	18	22	126	125
Number of banks.....	10	15	23	126	124
Total capital stock.....	\$375,000	\$525,000	<sup>1</sup> \$780,000	<sup>1</sup> \$765,000	<sup>1</sup> \$825,000
Amount of deposits.....	\$3,238,000	\$3,219,000	<sup>2</sup> \$5,279,730	<sup>2</sup> \$4,500,000	<sup>2</sup> \$3,562,000
Number of depositors.....	9,156	11,640	17,600	14,000	12,560

<sup>1</sup> Includes Chinook division.

<sup>2</sup> Deposits received from large area not in project.

## MONTANA, SUN RIVER PROJECT.

GEO. O. SANFORD, project manager, Great Falls, Mont.

The Sun River project is located in Cascade, Chouteau, Lewis and Clark, and Teton Counties, lying to the north and west of Great Falls, Mont. It is served by lines of the Great Northern and the Chicago, Milwaukee & St. Paul Railways. The sources of water supply are Sun River and its tributaries, Deep Creek, Bowl Creek, and Basin Creek. The average elevation of the irrigable area is about 3,700 feet above sea level; the soil is loam, clay, and alluvium. The average annual rainfall is 10.9 inches; the average annual temperatures are: Maximum, 96° F.; minimum, -33° F.; mean 44° F. The length of the irrigation season is from May 1 to October 10, 163 days; the principal crops are hay, grain, vegetables, live stock, and dairy products. The principal markets are Great Falls, St. Paul, Minneapolis, and Chicago.

The Fort Shaw division is watered by a canal system taking water from the Sun River. For the irrigation of lands north of Sun River, water is diverted from the North Fork of Sun River and is carried through Pishkun, Sun River Slope, and Greenfields Canals to the head of the irrigable lands in Greenfields division. The distribution system has been built for the irrigation of 25,000 acres in part 1 of Greenfields division, and for 2,300 acres in Big Coulee division. That for about 12,000 acres in part 2 of Greenfields division is under construction.

Plans for future development provide for storage works on the upper North Fork of Sun River, enlargement of Pishkun, Sun River Slope, and Greenfields Canals, and construction and extension of lateral systems under the canals. Possible future development may include the diversion of Bowl and Basin Creeks across the Continental Divide into Sun River drainage, the enlargement of Willow Creek Reservoir and diversion of water from North Fork of Sun River thereto, the enlargement of Pishkun Reservoir and diversion of water from Deep Creek thereto, storage works on Muddy Creek and in Benton Lake, and canal systems for the Vaughn, Benton, and Great Falls divisions.

### SUMMARY OF DATA FOR SUN RIVER PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		169,700
Public land entered to June 30, 1922.....	42,900	
Public land withdrawn on June 30, 1922.....	39,000	
State land unsold on June 30, 1922.....	9,500	
Railroad land unsold on June 30, 1922.....	249	
Other private land, June 30, 1922.....	78,051	
Acreage service could supply, season 1921.....		40,057
Estimated acreage service could supply, season 1922.....		42,300
Acreage irrigated, season of 1921.....		21,750
Acreage cropped under irrigation, season 1921.....		21,090
Value of irrigated crops, season 1921.....		\$290,380
Value of irrigated crops per acre cropped.....		\$13.75
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$706,500.72	
Encumbrances, disbursements, and liabilities.....	119,866.33	
Unencumbered balance July 1, 1922.....		\$586,634.39
Fiscal year 1923, amount specified in appropriation act.....		345,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$108,490.41	\$4,037,839.78
Less water-right contracts, project lands..... 13,048.05 acres..		2,712.00	427,697.84
Balance.....		100,778.41	3,610,141.94
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$17,510.77	\$177,667.60	\$11,928.77
Less:			
Charges billed or contracted.....	26,717.77	149,482.86	26,717.77
Penalties and discounts (net).....	* 201.13	* 1,156.01	* 10.83
Total.....	26,516.64	148,326.85	148,260.60
Balance.....	* 9,006.87	29,340.75	* 14,778.17
			37,586.40

\* Contra.



*Summary of data for Sun River project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Court of Claims.	Increase of compensation.	Totals.
Investment to date:				
Disbursements and net transfers.....	\$4,340,390.64	\$1,585.35	\$57,608.52	\$4,399,569.51
Less collections.....	402,418.37			402,418.37
Net investment.....	3,937,962.27	1,585.35	57,608.52	3,997,151.14

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges .....	\$11,746.44	\$148,793.34	\$5,942.24	\$135,863.49	.....	\$12,929.55
Construction water-right charges paid in advance.....	.....	.....	.....	29,418.41	.....	.....
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands, (13,048.05 acres).....	26,717.77	149,482.86	8,312.61	114,683.51	\$2,679.07	32,120.26
Penalties and interest .....	.....	1,456.81	247.25	1,456.81	.....	.....
Total.....	26,717.77	150,939.67	8,559.86	116,140.32	2,679.07	32,120.26
Operation and maintenance charges paid in advance.....	.....	.....	.....	10.55	.....	.....
Revenues:						
Rentals of irrigating water..	22,102.45	34,887.86	5,861.44	12,665.30	140.75	22,061.51
Rentals of grazing and farming lands.....	2,543.08	28,116.55	4,586.78	23,355.00	.....	4,761.55
Total.....	24,645.53	63,004.41	10,448.22	36,020.30	140.75	26,843.36
Miscellaneous uncollected.....	.....	.....	1,842.89	84,965.30	.....	416.36
Other miscellaneous collections.....	.....	.....	.....	.....	.....	.....
Grand total collections.....	.....	.....	26,793.21	402,418.37	.....	.....

**ACTIVITIES DURING FISCAL YEAR.**

The principal construction work during the fiscal year 1922 consisted of completing the lateral system for the Big Coulee division, which provides for irrigating 2,300 acres, and of beginning the lateral system for the second part of Greenfields division. About 17 miles of laterals had been excavated and contracts had been awarded for the completion of the laterals and structures to irrigate about 12,000 acres. On the Fort Shaw division, lateral D was extended 3.4 miles to reach about 115 acres of land included in existing farm units.

Precipitation for the calendar year 1921 was below normal and during the season 1921 about 12,200 acre-feet of stored water were drawn from Willow Creek Reservoir for irrigation use. The run-off from Willow Creek was not sufficient to replace all this water and the storage on June 30, 1922, was 13,355 acre-feet. Precipitation during the first half of 1922 was above the average and irrigation was light. Crops were in excellent condition.

Maintenance work consisted of cleaning laterals, replacing worn-out structures on the distribution system, caulking cracks in the concrete

lining of Greenfields Canal, telephone line repairs, and repairing the outlet structure of Willow Creek Reservoir by placing a timber facing against the concrete walls, which had become partially disintegrated through alkali and frost action.

*Operation data, Sun River project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	16,322	16,224	14,978	40,057	40,057	40,057
Acreage irrigated.....	4,717	6,675	7,569	11,496	14,780	21,750
Miles of canal operated.....	100	100	96	244	260	267
Water diverted (acre-feet).....	17,841	25,481	30,067	42,868	75,595	88,288
Water delivered to land (acre-feet).....	5,757	9,091	11,193	24,060	21,653	30,300
Per acre of land irrigated (acre-feet).....	1.22	1.36	1.48	1.9	1.47	1.39

*Settlement data, Fort Shaw and Greenfields divisions, Sun River project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	265	254	239	212	500	500
Population.....	436	476	506	542	1,000	1,000
Number of irrigable farms.....	158	176	187	201	354	387
Operated by owners or managers.....	108	120	118	151	264	260
Operated by tenants.....	55	56	69	50	90	97
Population.....	436	476	506	542	861	949
Number of towns.....	8	8	8	8	8	4
Population.....	179	168	158	155	685	378
Total population in towns and on farms.....	615	644	666	697	1,685	1,378
Number of public schools.....	4	4	4	4	17	17
Number of churches.....	3	4	4	4	11	11
Number of banks.....	1	1	1	1	15	3
Total capital stock.....	\$20,000	\$20,000	\$20,000	\$20,000	\$110,000	\$65,000
Amount of deposits.....	\$85,000	\$95,000	\$98,000	\$110,000	\$391,121	\$150,000
Number of depositors.....	290	310	390	400	1,278	790

<sup>1</sup> Applies to whole project rather than to the two divisions named.

# MONTANA-NORTH DAKOTA, LOWER YELLOWSTONE PROJECT.

L. H. MITCHELL, project manager, Savage, Mont.

The Lower Yellowstone project is located on the west side of the Yellowstone River in eastern Montana and western North Dakota. The source of water supply is the Yellowstone River, diversion from which into the main canal is at a point 18 miles below Glendive. Irrigation works have been constructed since 1909 to deliver water to about 40,000 acres. Water will be available for the entire irrigable area beginning with 1923. The length of the irrigation season depends upon the amount of precipitation in the spring. May 1 to October 10, 163 days, is the maximum length of water deliveries. The average elevation is 1,900 feet above sea level and the project is free from humidity and not too high for frosts early in the fall or late in the spring. Since 1905 the average annual rainfall has been a little less than 15 inches; the average of the highest temperature is 103° F. and the average of the lowest is -35° F. Some alkali and gumbo are found in scattering low tracts, but the project as a whole has a deep sandy loam soil. As the irrigable area of the project is a long and narrow tract of land with cross-drainage creeks at intervals of 3 to 6 miles, seepage has not been serious. The duty of water is about 1.5 acre-feet per acre. The principal crops raised are alfalfa, grain, sugar beets, potatoes, and corn. Billings, Mont., is the market for sugar beets; Duluth and Minneapolis, Minn., for grain; Chicago and the South for potatoes. Forage crops are consumed locally.

## SUMMARY OF DATA FOR LOWER YELLOWSTONE PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		59,529
Public land entered to June 30, 1922.....	13,994	
Public land withdrawn on June 30, 1922.....	2,412	
State land unsold on June 30, 1922.....	996	
Railroad land unsold on June 30, 1922.....	97	
Other private land, June 30, 1922.....	42,050	
Acreage service could supply, season of 1921.....		40,344
Acreage irrigated, season of 1921.....		19,980
Acreage dropped under irrigation, season of 1921.....		19,980
Acreage dry-farmed, season of 1921.....		9,677
Value of irrigated crops, season of 1921.....		\$304,220.00
Value of irrigated crops per acre cropped.....		\$15.23
Value of dry-farmed crops, season of 1921.....		\$80,604.25
Value of dry-farmed crops per acre cropped.....		\$8.23
<b>Finances:</b>		
Appropriations—		
Fiscal year 1922, all congressional authorizations.....	\$360,958.79	
Encumbrances; disbursements and liabilities.....	261,123.78	
Unencumbered balance July 1, 1922.....		\$99,835.10
Fiscal year 1923, amount specified in appropriation act.....		180,000.00

		Fiscal year, 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$494,425.17	\$3,566,405.65
Less water-right contracts, project lands (58,248.11 acres).....			3,614,104.21
Balance.....		694,425.17	\$47,698.56
	Calendar year, 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$467,914.14	\$291,955.27	32,065.01
Less—			
Charges billed or contracted.....	32,416.43	293,523.13	\$9,757.71
Penalties and discounts (net).....	*2.04	*2.04	162,263.69
Total.....	32,414.39	293,521.09	*9,757.71
Balance.....	\$500,328.53	*1,565.82	41,822.72
			18,543.13

<sup>1</sup> Due to operation and maintenance charges added to construction, \$522,500.05.

\* Contra.

NOTE.—Operation and maintenance account adjusted during the calendar year 1921 by the transfer of \$522,500.05 cost to construction.

*Summary of data for Lower Yellowstone project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensation.	Total.
Investment to date:				
Disbursements and net transfers.....	\$3,888,031.68	\$12,835.98	\$24,738.75	\$3,925,606.31
Less collections.....	279,062.71			279,062.71
Net investment.....	3,608,978.97	12,835.98	24,738.75	3,646,553.60

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....		\$41,135.10		\$41,135.10		
Construction water-right charges paid in advance.....				197.60		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (37,195.87 acres).....		144,170.56	\$8,542.42	45,334.83	\$4.63	\$98,831.10
Penalties and interest.....		2.59		2.59		
Total.....		144,173.15	8,542.42	45,337.42	4.63	98,831.10
Operation and maintenance charges paid in advance.....				101.00		
Revenues:						
Rentals of irrigating water.....	\$112.16	122,023.08	669.11	119,468.25		2,554.83
Rentals of grazing and farming lands.....	392.74	2,701.37	223.74	2,668.37		33.09
Total.....	444.90	124,724.45	892.85	122,136.62		2,587.88
Miscellaneous uncollected.....						901.34
Other miscellaneous collections.....			2,852.42	70,144.97		
Grand total collections.....			12,287.69	279,062.71		

**ACTIVITIES DURING FISCAL YEAR.**

Construction of the Thomas Point pumping plant began on March 12, 1922, by Government forces and was completed about the end of July. The earthwork on the main canal and laterals, involving about 532,500 cubic yards of excavation, will be completed early in the fall of 1922. Construction of structures on the main canal and lateral extensions, involving the placing of 150,000 feet b. m. of lumber, erecting 450 linear feet of metal flume, placing 36,000 pounds of reinforcing steel, 680 cubic yards of reinforced concrete, 600 linear feet of clay and metal pipe, and the necessary excavation and back filling for structures, will be completed about October 31, 1922. Turnouts for farms ready for water under canal and lateral extensions will be constructed by Government forces as needed. Nearly all drops have been replaced with reinforced concrete structures and the turnouts have been replaced with the same type of structure.

During the last two seasons the principal items of expense in maintaining the works have been keeping the laterals cleaned of silt and raising the unstable banks of the main canal below the Thomas Point pumping plant. Prior to 1921 endeavor was made to keep the laterals cleaned with slip teams. This was slow and expensive. In June, 1921, a Ruth ditch-cleaning machine was purchased, and during the remainder of the season 22.2 miles of laterals were cleaned; 36,476 cubic yards of material were moved at unit cost of 0.073 cents per cubic yard.

*Operation data, Lower Yellowstone project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	42,288	42,288	42,232	42,167	<sup>1</sup> 40,200	<sup>1</sup> 40,344
Acreage irrigated.....	6,020	15,744	21,075	21,300	19,120	19,980
Miles of canal operated.....	151	180	186	188	187	174
Water diverted (acre-feet).....	27,181	60,205	51,445	70,029	47,375	64,972
Water delivered to land (acre-feet).....	7,545	27,842	23,321	26,252	16,633	25,733
Per acre of land irrigated (acre-feet).....	1.25	1.77	1.11	1.23	.97	1.28

<sup>1</sup> District lands only.

*Settlement data, Lower Yellowstone project.*

Item.	<sup>1</sup> 1918	<sup>1</sup> 1919	<sup>2</sup> 1920	<sup>2</sup> 1921
Total number of irrigable farms on the project.....	514	514	543	572
Population.....	1,120	1,284	1,368	1,380
Number of irrigated farms.....	370	405	375	370
Irrigable farms operated by owners.....	200	204	226	178
Irrigable farms operated by tenants.....	75	85	94	117
Irrigable farms having neither owner nor tenant living thereon.....	165	166	172	277
Number of towns.....	8	8	8	8
Population.....	3,500	3,900	2,860	2,805
Total population in towns and on farms.....	4,620	5,184	<sup>3</sup> 4,218	4,195
Number of public schools.....	19	<sup>4</sup> 12	<sup>4</sup> 12	<sup>4</sup> 12
Number of churches.....	8	13	15	15
Number of banks.....	10	10	10	<sup>5</sup> 9
Total capital stock.....	\$330,000	\$330,000	\$380,000	\$335,080
Amount of deposits.....	\$2,000,000	\$2,365,000	\$2,331,900	\$1,851,000
Number of depositors.....	7,000	7,500	6,500	4,726

<sup>1</sup> Project on rental basis.

<sup>2</sup> Project operated under contracts with irrigation districts.

<sup>3</sup> Part of decrease due to exact census.

<sup>4</sup> Decrease in number of schools due to consolidation.

<sup>5</sup> Decrease in number of banks due to consolidation.

# NEBRASKA-WYOMING, NORTH PLATTE PROJECT.

ANDREW WEISS, project manager, Mitchell, Nebr.

The North Platte project is situated in western Nebraska and eastern Wyoming. The source of water supply is the North Platte River. The irrigation plan provides for storage of flood waters of the river in Pathfinder Reservoir, located about 50 miles southwest of Casper, Wyo., and in smaller reservoirs along the canal lines, and diversion from the North Platte River by a dam near Whalen, Wyo., into the Interstate Canal, supplying water for lands on the north side of the river, and into the Fort Laramie Canal watering lands on the south side. The Northport division on the north side in the vicinity of Northport, Nebr., will be watered from an extension of the Tri-State Canal. The limit of area of farm units on all divisions is 80 acres for public and 160 acres for private land. The railroads serving the project cities and towns, which have an estimated population of 29,900, are the Chicago, Burlington & Quincy and Union Pacific. The character of the soil varies from sandy loam on the major portion of the Interstate and Northport divisions to gumbo soil on portions of the Fort Laramie division. The principal products are alfalfa, cereals, corn, sugar beets, and potatoes, and the principal markets are Omaha, Nebr., Kansas City and St. Joseph, Mo., Denver, Colo., and central Wyoming. The length of the irrigating season is from April 1 to September 30 and the average rainfall amounts to 14.74 inches. The average temperature ranges between 98° maximum and -24° F. minimum.

## SUMMARY OF DATA FOR NORTH PLATTE PROJECT TO END OF FISCAL YEAR 1922.

	Interstate.	Fort Laramie.	Northport.	Total.
<b>Areas and crops:</b>				
Irrigable acreage when project is complete....	130,545	107,000	15,000	252,545
Public land entered to June 30, 1922.....	83,681	44,689	6,500	134,872
Public land withdrawn on June 30, 1922.....	411	15,511	500	16,424
State land unsold on June 30, 1922.....	529	7,325	1,400	9,250
Private land, June 30, 1922.....	45,924	39,475	6,600	91,999
Acreage service could supply, season of 1921..	129,666	16,222	2,250	148,148
Acreage irrigated, season of 1921.....	97,406	12,150	2,250	111,800
Acreage cropped under irrigation, season of 1921.....	96,470	12,140	1,800	110,410
Value of irrigated crops, season of 1921.....	\$2,737,900	\$186,930.00	\$35,900.00	\$2,960,730
Value of irrigated crops, per acre cropped....	\$28.38	\$15.56	\$20.00	\$26.88

<b>Finances:</b>	
<b>Appropriations—</b>	
Fiscal year 1922, all congressional authorizations.....	\$2,273,647.31
Encumbrances, disbursements, and liabilities.....	1,338,063.75
Unencumbered balance July 1, 1922.....	\$935,583.56
Fiscal year 1923, amount specified in appropriation act.....	1,440,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$1,294,760.21	\$12,962,329.94
<b>Less:</b>		
Funds advanced and unapplied cooperative credits.....	1,579.91	1,579.91
Water-right contracts:		
Project lands (108,373.46 acres).....	1,821,400.86	7,828,562.86
Warren Act lands (125,873 acres).....		1,019,663.88
<b>Total.....</b>	<b>1,822,980.77</b>	<b>8,849,806.65</b>
<b>Balance.....</b>	<b>* 528,220.56</b>	<b>4,112,523.29</b>

\* Contra.

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Summary of data for North Platte project to end of fiscal year 1922—Continued.

	Calendar year 1921.	To Dec. 31, 1921.	Fiscal year 1922.	To June 30, 1922.
Net operation and maintenance cost.....	\$262,096.95	\$1,429,961.96	\$181,343.78	\$1,525,951.14
Less:				
Charges billed or contracted.....	189,649.54	1,570,779.46	204,369.89	1,589,206.38
Penalties and discounts (net).....	* 11,628.66	* 10,881.26	718.58	* 10,781.04
Total.....	178,020.89	1,559,898.20	205,088.47	1,578,425.34
Balance.....	84,076.07	* 129,236.24	* 23,744.69	* 52,474.20

	Reclamation fund.	Judgments Court of Claims.	Increase of com- pensation.	Total.
Investment to date:				
Disbursements and net transfers.....	\$15,016,426.20	\$26,425.67	\$392,558.74	\$15,335,420.61
Less collections.....	3,322,073.03			3,322,073.03
Net investment.....	11,694,363.17	26,425.67	292,558.74	12,013,347.58

\* Contra.

Status of current accounts receivable as of June 30, 1922.

	Due.		Collected.			Uncol- lected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Funds advanced and un-						
applied cooperative cred-						
its.....	\$1,579.91	\$1,579.91	\$1,579.91	\$1,579.91		
Water-right charges.....	357,271.81	1,980,103.51	190,767.69	1,532,600.75	\$33,816.79	\$413,625.97
Total.....	358,851.72	1,981,683.42	192,347.60	1,534,240.66	33,816.79	413,625.97
Construction water-right charges paid in advance.....				1,112.91		
To return net operation and maintenance cost:						
Operation and maintenance charges—						
Project lands (107,000 acres).....	185,087.37	1,408,123.83	83,744.67	1,066,184.56	39,211.25	302,778.02
Warren Act lands (ap- proximately 120,000 acres).....	19,332.52	181,082.55	4,401.56	147,603.66	12.23	33,466.66
Penalties and interest.....	3,328.03	19,197.66	3,328.03	19,068.62	129.04	
Total.....	207,697.92	1,608,404.04	91,474.26	1,232,806.84	39,352.52	336,244.68
Operation and maintenance charges paid in advance.....				207.73		
Revenues:						
Rentals of irrigating water ..	51,684.52	159,957.73	56,276.05	158,464.49	2.00	1,491.24
Rentals of power and light ..	27,407.19	54,673.46	24,410.02	41,554.85	10,907.55	2,211.06
Rentals of grazing and farming lands ..	9,683.36	70,762.53	9,779.45	65,797.49		4,965.13
Total.....	88,775.07	285,393.72	90,465.52	265,816.74	10,909.55	8,667.43
Miscellaneous uncollected.....						58,360.49
Other miscellaneous collections.....			41,988.29	287,888.15		
Grand total collections.....			416,275.67	3,322,073.03		

## CONSTRUCTION DURING FISCAL YEAR.

*Storage division.*—The construction of the north tunnel outlet works, Pathfinder Dam, was completed during June, 1922. The work involved the rock excavation for and concrete lining of the outlet tunnel and construction of the valve house; the installation of two 58-inch balanced needle valves; 5 by 5 foot emergency gate; 3 by 5 foot sluice gate; and the erection of a sluice-gate house at the head of shaft No. 2.

*Fort Laramie division.*—The excavation of the Fort Laramie Canal continued by drag-line excavators throughout the year, all work in Wyoming being completed October 31, 1921. The three electric machines on this work completed 19.35 miles of canal during the year, handling 1,318,534 cubic yards of material at an average field cost of \$0.095 per cubic yard. During the year 7,070 acres of land in Upper Cherry Creek Valley and 19,550 acres of land, which comprises the entire Springer lateral system, were made ready for irrigation with the completion of the above work; all land lying west of Horse Creek in Wyoming is ready for irrigation. Thirty-two miles of laterals, involving the excavation of 162,870 cubic yards of material, and 2,123 structures having a concrete yardage of 7,882 were completed. Work was started on the Horse Creek system the latter part of May, 1922.

*Northport division.*—Fourteen miles of the Northport Canal, involving the excavation of 742,000 cubic yards of material by drag lines and teams, were completed. Fifty miles of laterals with a yardage of 172,000 and 703 lateral structures having a concrete yardage of 3,400 were constructed. The above work makes ready 4,675 acres for irrigation during the season of 1922.

*Drainage.*—On the Interstate division 5.55 miles of outlet drain were built. The total drag-line excavation amounted to 149,200 cubic yards. The work consisted of the construction of a structure carrying the Minatare drain under the Nine Mile drain and the excavation incidental to the fulfillment of the obligations on the part of the United States under the Nine Mile contract. A start was made on the construction of the Spottedtail Outlet Channel, which eventually will serve as an outlet to the Dutch Flats area.

On the Fort Laramie division 5.2 miles of drain involving the excavation of 105,878 cubic yards of material were finished. This completes the construction of the Cherry Creek drainage system, which will drain all land in the Cherry Creek Basin. On the Katzer drain 6.9 miles of drain were constructed involving 308,015 cubic yards of material. When completed this drain will serve as an outlet for all seepage waters developing from lands under the Springer lateral system draining into the Katzer Basin.

## OPERATION AND MAINTENANCE.

*Interstate division.*—Betterments were continued on the Interstate Canal, reinforcing banks between miles 35.8 and 42.3, and widening the canal between miles 38.2 and 40.0, and between miles 13.0 and 13.6. Structure replacement continued on all lateral districts, 680 wooden structures being replaced during the year.

*Fort Laramie division.*—The canal was operated the entire year to serve the Lingle power plant. During the irrigation season the



canal discharge averaged 300 second-feet, and during the winter months the effective head averaged about 50 second-feet. One drag line was engaged in the removal of silt and sand from the upper reaches of the Fort Laramie Canal.

*Operation data, Interstate division, North Platte project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	<sup>1</sup> 129,891	<sup>1</sup> 129,891	<sup>1</sup> 129,778	<sup>1</sup> 129,715	<sup>1</sup> 129,629	<sup>1</sup> 129,666
Acreage irrigated.....	<sup>1</sup> 84,208	<sup>1</sup> 92,553	<sup>1</sup> 97,908	<sup>1</sup> 99,418	<sup>1</sup> 97,640	<sup>1</sup> 97,400
Miles of canal operated.....	800	805	805	805	807	809
Water delivered to land (acre-feet).....	<sup>2</sup> 164,240	<sup>2</sup> 177,472	<sup>2</sup> 204,819	<sup>2</sup> 201,505	<sup>2</sup> 175,153	<sup>2</sup> 186,328
Per acre of land irrigated (acre-feet).....	<sup>2</sup> 2.17	<sup>2</sup> 2.13	<sup>2</sup> 2.31	<sup>2</sup> 2.27	<sup>2</sup> 1.99	<sup>2</sup> 2.14

<sup>1</sup> Includes North Platte Canal & Colonization Co. lands.

<sup>2</sup> Exclusive of lands under North Platte Canal & Colonization Co. tract.

*Operation data, Fort Laramie division, North Platte project, by calendar years.*

Item.	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	12,132	12,132	16,232	16,232
Acreage irrigated.....	4,865	6,268	8,530	12,159
Miles of canal operated.....	70	79	130	133
Water delivered to the land (acre-feet).....	5,037	18,050	16,785	22,665
Per acre of land irrigated (acre-feet).....	1.04	2.89	1.97	1.85

*Operation data, Northport division, North Platte project.*

Item.	1920	1921
Acreage for which service was prepared to supply water.....	1,600	2,239
Acreage irrigated.....	1,220	2,269
Water delivered to the land (acre-feet).....	1,526	3,864
Per acre of land irrigated (acre-feet).....	1.27	1.75

### SETTLEMENT.

All of the land thrown open to entry in September, 1921, has been filed upon and the majority of the entrymen have built substantial homes and are making other improvements incidental to successful farming under irrigation.

The development of the Fort Laramie division has been enhanced greatly by the construction of the Union Pacific Railroad through the central portion of this division, and the construction of a spur tapping Cherry Creek Valley. As a result five towns have been started. Bailey and Lyman in Nebraska, and Huntley, Yoder, and Veteran, the latter a Government town site, in Wyoming.

*Settlement data, Interstate division, North Platte project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	1,406	1,406	1,420	1,410	1,450
Population.....	4,500	4,500	4,500	5,000	5,700
Number of irrigated farms.....	1,274	1,274	1,310	1,300	1,340
Operated by owners or managers.....	810	774	880	800	8710
Operated by tenants.....	464	500	450	500	630
Population.....	4,056	4,200	4,056	4,746	5,200
Number of towns.....	7	8	8	9	9
Population.....	8,000	11,000	11,610	14,382	14,400
Total population in towns and on farms.....	12,500	15,500	16,110	19,382	20,100
Number of public schools.....	40	40	40	40	5. 40
Number of churches.....	25	25	25	26	26
Number of banks.....	16	16	21	21	27
Total capital stock.....	\$352,000	\$352,000	\$462,000	\$777,500	\$787,500
Amount of deposits.....	\$2,400,000	\$2,600,000	\$3,100,000	\$7,371,100	\$6,834,400
Number of depositors.....	7,000	7,200	7,500	12,000	11,200

*Settlement data, Fort Laramie division, North Platte project.*

Item.	1921	Item.	1921
Total number of farms on project.....	407	Total population in towns and on farms.....	4,400
Population.....	1,500	Number of public schools.....	10
Number of irrigated farms.....	190	Number of churches.....	1
Operated by owners or managers.....	105	Number of banks.....	18
Operated by tenants.....	85	Total capital stock.....	* \$185,000
Population.....	433	Amount of deposits.....	* \$1,039,600
Number of towns.....	3	Number of depositors.....	5,500
Population.....	2,900		

<sup>1</sup> Lands on the Interstate and Fort Laramie divisions are tributary to 6 of the banks listed above.

<sup>2</sup> \$155,000 of this amount is listed under similar caption on Interstate division.

<sup>3</sup> \$619,600 of this amount is listed under similar caption on Interstate division.

## NEVADA, NEWLANDS PROJECT.

JOHN F. RICHARDSON, project manager, Fallon, Nev.

The Newlands project is located on the Southern Pacific railroad in Churchill, Storey, and Lyon Counties, Nev. The water supply is from the Truckee and Carson Rivers. The average rainfall on the irrigable area, which is at an elevation of about 4,000 feet above sea level, is 4.43 inches. The principal crops are alfalfa, grain, potatoes, melons, and dairy products. Farm units range in size from 40 to 160 acres.

### SUMMARY OF DATA FOR NEWLANDS PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		159,000
Public land entered to June 30, 1922.....	29,438	
Public land open to entry on June 30, 1922.....	3,253	
Public land withdrawn on June 30, 1922.....	29,432	
Indian land, June 30, 1922.....	23,877	
Railroad land unsold on June 30, 1922.....	20,000	
Other private land, June 30, 1922.....	53,000	
Acreage service could supply, season of 1921.....		72,166
Acreage irrigated, season of 1921.....		46,160
Acreage cropped under irrigation, season of 1921.....		43,440
Value of irrigated crops, season of 1921.....	\$1,254,580.00	
Value of irrigated crops per acre cropped.....		\$28.88
<b>Finances:</b>		
Appropriations—		
Fiscal year 1922, all congressional authorizations.....	\$1,532,785.57	
Encumbrances, disbursements, and liabilities.....	400,796.25	
Unencumbered balance July 1, 1922.....		\$1,131,989.32
Fiscal year 1923, amount specified in appropriation act.....		915,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$191,848.04	\$6,691,414.32
Less water-right contracts, project lands (49,996 acres).....		669,642.48	2,662,614.01
Balance.....		* 477,794.44	3,998,800.31
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$106,501.12	\$356,625.54	101,781.75
Less:			
Charges billed or contracted.....	122,635.69	687,625.63	217,966.89
Penalties and discounts (net).....	* 1,613.22	* 4,916.63	* 746.73
Total.....	121,022.47	682,709.00	217,220.16
Balance.....	*14,521.35	173,916.54	* 115,438.41
			148,845.75

NOTE.—Operation and maintenance charges billed or contracted for fiscal year 1922 and to June 30, 1922, include item of \$95,500, representing amount of operation and maintenance deficit covered by contract dated May 25, 1922, with Truckee-Carson irrigation district.

	Reclamation fund.	Increase of compensa- tion.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$8,049,792.98	\$69,264.93	\$8,119,057.91
Less collections.....	1,439,828.71		1,439,828.71
Net investment.....	6,609,964.27	69,264.93	6,679,229.30

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....	\$40,181.40	\$406,570.37	\$31,162.50	\$462,654.41	\$5,447.40	\$18,468.06
Construction water-right charges paid in advance.....				876.27		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (70,041 acres).....	122,606.54	687,372.63	68,016.71	501,240.83	19,540.97	76,590.63
Penalties and interest.....	691.30	7,297.60	654.79	7,261.18	36.51	
Total.....	123,297.84	694,670.23	68,671.50	508,502.01	19,577.48	76,590.63
Operation and maintenance charges paid in advance.....				104.96		
Revenues:						
Rentals of irrigating water..	1,885.10	15,653.27	1,800.35	15,568.52		84.75
Rentals of power and light..	21,945.34	161,134.37	21,827.07	134,183.78	25,487.75	1,462.84
Rentals of grazing and farming lands.....	373.50	24,062.29	335.10	24,013.89		38.40
Total.....	24,203.94	300,839.93	23,962.52	173,766.19	25,487.75	1,585.99
Miscellaneous uncollected.....						1,068.13
Other miscellaneous collections.....			9,623.28	183,924.87		
Grand total collections.....			153,419.80	1,439,828.71		

#### ACTIVITIES DURING FISCAL YEAR.

About 4.9 miles of laterals involving approximately 33,850 cubic yards of earthwork, were constructed largely under contract.

The lower bank of the Truckee Canal was reinforced between stations 561 and 1098 and rock slides were removed from the upper sections of this canal, using drag-line excavators.

A new timber-steel check structure was placed in the Truckee Canal below the head of the KE lateral. The Southern Pacific Co., under the terms of a special contract, installed a concrete-cast iron siphon in the Lisle lateral under the railroad near Fernley, Nev.

Numerous minor timber structures were installed in laterals by Government forces.

**Drainage.**—Excavation of deep open drains under the contract with the Truckee Carson irrigation district was commenced on August 11, 1921. Seven drag-line excavators were in operation on this work at the end of the fiscal year, during which period 46.3 miles of drain, involving the removal of 1,711,857 cubic yards of material, were completed, together with necessary structures.

Several conferences were held during the year between officials of the Reclamation Service and the Canyon Power Co. for the settlement of conflicting interests on the Truckee River preliminary to the commencement of work on the Spanish Springs Reservoir.

**Operation and maintenance.**—Commencing during July, 1921, and continuing through August, the lack of stored water in Lake Tahoe and shortage in the Truckee River made it necessary to rotate between laterals and water users to satisfy irrigation requirements in the Truckee district.

An important feature of the maintenance work consisted of relining with reinforced concrete the Gilpin wasteway tunnel, 120 feet in length, out of the Truckee Canal. The failure of the original concrete lining made this work necessary. Temporary lining of portions of the Truckee Canal tunnels Nos. 1 and 3 was also necessary to insure their safety.

A large part of the maintenance work on laterals was done under cleaning contracts during the early part of 1922. Advertisements were issued and bids received covering about 42 miles of laterals, divided between 25 schedules of work. Unit bids on contracts awarded ranged from \$1.50 to \$11 per station of 100 feet.

On May 22, 1922, Lahontan Reservoir was filled and water flowed over the spillways at elevation 4162 for the first time.

The Lahontan power plant was operated during the entire year under lease by the Canyon Power Co.

*Operation data, Newlands project, by calendar years.*

Item.	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	70, 915	71, 817	65, 809	69, 310	72, 166
Acreage irrigated.....	40, 392	42, 311	44, 324	45, 610	46, 160
Miles of canal operated.....	355	356	365	389	393
Water diverted (acre-feet).....	263, 433	266, 927	317, 424	295, 225	314, 241
Water delivered to land (acre-feet).....	125, 375	126, 545	134, 015	129, 814	132, 738
Per acre of land irrigated (acre-feet).....	3.06	2.99	3.02	2.85	2.87

*Settlement data, Newlands project.*

Item.	1917	1918	1919	1920	1921
Number of farms on project.....	600	610	675	785	870
Population.....	2, 197	2, 268	2, 386	2, 528	2, 632
Number of irrigated farms.....	600	648	694	742	788
Operated by owners or managers.....	525	568	649	677	708
Operated by tenants.....	75	80	75	65	80
Population.....	2, 197	2, 268	2, 386	2, 528	2, 632
Number of towns.....	5	5	5	5	5
Population.....	1, 860	1, 900	2, 240	2, 630	2, 500
Total population, towns and on farms.....	4, 057	4, 168	4, 626	5, 158	5, 132
Number of public schools.....	16	14	11	12	11
Number of churches.....	7	7	7	8	8
Number of banks.....	2	2	2	2	1
Capital stock.....	\$116, 000	\$116, 000	\$150, 000	\$115, 900	\$75, 000
Amount of deposits.....	\$371, 240	\$632, 000	\$790, 000	\$364, 360	\$677, 104
Number of depositors.....	775	1, 214	1, 380	2, 500	2, 000

<sup>1</sup> Fallon district schools consolidated in 1919.

## NEW MEXICO, CARLSBAD PROJECT.

L. E. FOSTER, project manager, Carlsbad, N. Mex.

The Carlsbad project is located in Eddy County, N. Mex., on the Santa Fe Railway system. Project cities and towns are Carlsbad, population 3,000, and Otis, Loving, and Malaga, with a combined population of about 375. The source of water supply is Pecos River. The length of the irrigation season is 260 days, which includes two weeks in winter. The average elevation of the irrigable area is 3,100 feet. The rainfall averages 14.25 inches. The average of recorded temperatures for a period of 21 years ranges from 112° to -7° F. The soil of the irrigable area is Pecos clay and sandy loam, with high lime content. The principal products are cotton, alfalfa, and miscellaneous grains and fruits. The principal markets are Carlsbad, Kansas City, Chicago, New Orleans, and Galveston. The irrigation plan provides for the storage of water in Lake McMillan and in Avalon reservoir both controlled by earth and rock-fill dams. Water is diverted at Avalon reservoir into a canal system, which extends 25 miles in a southerly direction.

### SUMMARY OF DATA FOR CARLSBAD PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		24,991
Public land entered to June 30, 1922.....	55	
Other private land, June 30, 1922.....	24,936	
Acreage service could supply, season of 1921.....		24,991
Acreage irrigated, season of 1921.....		23,810
Acreage cropped under irrigation, season of 1921.....		21,620
Value of irrigated crops, season of 1921.....		\$919,650.00
Value of irrigated crops per acre cropped.....		\$42.53
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$110,474.48	
Encumbrances, disbursements and liabilities.....	53,096.42	
Unencumbered balance July 1, 1922.....		\$67,378.06
Fiscal year 1923, amount specified in appropriation act.....		65,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	*\$1,507.33	\$1,397,308.65
Less:		
Funds advanced and unapplied cooperative credits.....		7,980.06
Water-right contracts, project lands (24,859 acres).....		1,409,501.00
Total.....		1,417,481.06
Balance.....	*\$1,507.33	*\$20,177.41

	Calendar year 1921.	To Dec. 31, 1921.		
Net operation and maintenance cost.....	\$45,452.10	\$405,103.30	49,834.89	438,404.30
Less:				
Charges billed or contracted.....	58,059.30	394,179.14	57,768.57	\$98,888.41
Penalties and discounts (net).....	231.84	2,590.29	1,215.59	3,229.63
Total.....	58,291.14	396,769.43	58,984.16	397,118.04
Balance.....	*\$12,839.04	8,833.87	*\$9,149.27	41,286.26

	Reclamation fund.	Increase of compensa- tion.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$1,892,857.45	\$24,180.76	\$1,917,038.21
Less collections.....	746,006.38		746,006.38
Net investment.....	1,146,851.07	24,180.76	1,171,031.82

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected. June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Funds advanced.....		\$7,980.06		\$7,980.06		
Water-right charges.....	\$55,428.29	364,388.81	\$49,562.71	322,510.08		\$41,878.73
Total.....	55,428.29	372,368.87	49,562.71	330,490.14		41,878.73
Construction water-right charges paid in advance.....				856.22		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (24,859 acres).....	57,768.57	393,888.41	36,572.36	323,281.69	\$5,086.81	65,519.91
Penalties and interest.....	1,946.16	8,316.44	1,946.16	8,316.44		
Total.....	59,714.73	402,204.85	38,518.52	331,598.13	5,086.81	65,519.91
Revenues:						
Rentals of irrigating water..	1,473.70	18,858.44	1,473.70	18,858.44		
Rentals of grazing and farming lands.....	1,749.16	10,042.04	1,674.78	9,747.70		294.34
Total.....	3,222.86	28,900.48	3,148.48	28,606.14		294.34
Miscellaneous uncollected.....						152.94
Other miscellaneous collections.....			6,929.23	54,455.75		
Grand total collections.....			98,158.94	746,006.38		

**ACTIVITIES DURING FISCAL YEAR.**

*Operation and maintenance.*—The water supply was ample during the period. During the early part of the year considerable water was wasted; however, during the fall months of 1921 the storage was nearly exhausted and the reservoir was not entirely filled prior to the opening of the irrigation season of 1922, nor had it filled by the close of the fiscal year. There was no water shortage during the year. The spring of 1922 was somewhat late and heavy rains in April and May resulted in an unusual amount of replanting of row crops. Crops generally were in good condition at the close of the fiscal year. Minor damage was done to the concrete section of Black River Canal in July, 1921, and again in May, 1922. Repairs were made promptly without delaying water delivery. The canal and lateral system was thoroughly cleaned during the winter of 1922, and the wooden parts of all lateral structures were repaired or replaced.

In the case of the Pecos water-right adjudication, some progress was made during the year through interlocutory decrees entered by consent settling tentatively the rights of certain defendants. The hydrographic survey being made by the State engineer has not yet been completed. This work was somewhat delayed by lack of available funds. The Reclamation Service had advanced \$12,000 for this work up to the close of the fiscal year.

*Operation data, Carlsbad project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acres for which service was prepared to supply water.....	24, 775	24, 775	24, 775	24, 991	24, 991	24, 991
Acres irrigated.....	16, 600	16, 882	19, 460	20, 363	22, 170	23, 810
Miles of canal operated.....	45	45	45	45	45	45
Water diverted (acre-feet).....	106, 470	95, 196	97, 320	114, 660	131, 673	137, 500
Water delivered to land (acre-feet).....	40, 382	39, 589	47, 380	48, 933	53, 644	59, 371
Per acre of land irrigated (acre-feet).....	2. 43	2. 33	2. 43	2. 4	2. 42	2. 40

*Settlement data, Carlsbad project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	1 565	1 627	1 660	1 741	1 770	1 769
Population.....	694	992	1, 257	1, 378	1, 575	1, 435
Number of irrigated farms.....	455	535	458	565	368	426
Operated by owners or managers.....	1 167	1 190	1 231	1 296	1 189	1 277
Operated by tenants.....	83	243	227	267	267	149
Population.....	634	992	1, 257	1, 378	1, 575	1, 435
Number of towns.....	4	4	4	4	4	4
Population.....	3, 300	3, 300	3, 875	3, 375	3, 375	3, 375
Total population in towns and on farms.....	3, 934	4, 292	4, 632	4, 753	4, 950	4, 810
Number of public schools.....	7	7	7	7	13	13
Number of churches.....	8	8	8	8	11	11
Number of banks.....	3	3	3	3	6	3
Total capital stock.....	\$225, 000	\$275, 000	\$275, 000	\$275, 000	\$275, 000	\$225, 000
Amount of deposits.....	\$1, 243, 316	\$1, 271, 266	\$1, 238, 432	\$1, 271, 645	\$1, 049, 924	\$1, 176, 441
Number of depositors.....	2, 138	1, 941	2, 234	2, 611	2, 617	2, 350

<sup>1</sup> Water-right applications.

<sup>2</sup> Many farms were operated by one man.



## NEW MEXICO-TEXAS, RIO GRANDE PROJECT.

L. M. LAWSON, project manager, El Paso, Tex.

The Rio Grande irrigation project is an international and an interstate project, including within its present established boundaries approximately 86,000 acres of land in the Elephant Butte irrigation district of New Mexico and 64,000 acres in the El Paso County Water Improvement District No. 1, of Texas, and approximately 25,000 acres in the Republic of Mexico. The population of the principal city, El Paso, Tex., is 80,000, and the project lands have an additional population of 14,000.

Flood waters of the Rio Grande are stored in the Elephant Butte Reservoir. With an average rainfall of 10 inches the use of water for irrigation in addition is approximately 3 acre-feet per acre. The irrigation season normally is from February 1 to October 15. Practically all the lands of the project are in private ownership. All lands within the project limits in the United States are in irrigation districts, and contracts for repayment of construction charges, as well as yearly operation and maintenance cost, have been negotiated and executed between these districts and the United States.

The project is divided into four divisions, namely, the Rincon, Leasburg, Mesilla, and El Paso. Each of these divisions is furnished water supply by diversion from the Rio Grande. The last-named division utilizes an international diversion dam located near El Paso, and this structure, maintained jointly by the irrigators of both countries, also diverts the water into the main canal for the Mexican lands.

It is estimated that the construction and reconstruction of the lateral system was 60 per cent complete on June 30, 1922. The drainage system, now under construction, when completed will consist of 350 miles of deep open drain, involving excavation of 17,000,000 cubic yards. On June 30, 1922, 244.5 miles of main drain planned had been completed.

Power development at Elephant Butte Dam consists of a small plant required for the operation of the water system and furnishing of lights. At the time of the construction of the dam six power gates and penstocks were incorporated in the structure, and it is estimated that a power plant with an output of 18,000 kilowatts could be constructed at some future date.

### SUMMARY OF DATA FOR RIO GRANDE PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....	150,000	
Public land entered to June 30, 1922.....	600	
Public land open to entry on June 30, 1922.....	1,000	
Public land withdrawn on June 30, 1922.....	700	
State land unsold on June 30, 1922.....	1,000	
Private land, June 30, 1922.....	146,700	
Acreage service could supply, season of 1921.....		109,000
Acreage irrigated, season of 1921.....		85,580
Acreage cropped under irrigation, season of 1921.....		177,080
Value of irrigated crops, season of 1921.....		\$2,493,710.00
Value of irrigated crops per acre cropped.....		\$32.11
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$2,009,570.37	
Encumbrances, disbursements, and liabilities.....	837,170.78	
Unencumbered balance July 1, 1922.....		\$1,172,399.59
Fiscal year 1923, amount specified in appropriation act.....		1,000,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$794,053.27	\$11,315,348.98
Less:		
Nonreimbursable.....		1,000,000.00
Funds advanced for construction.....	5,000.00	5,000.00
Water-right contracts, project lands (85,000 acres).....		7,650,000.00
Total.....	5,000.00	8,655,000.00
Balance.....	789,053.27	2,660,348.98

<sup>1</sup> Includes 1,120 acres in Fort Hancock area, below the project supplied with excess stored water.

<sup>2</sup> 34 Stat., 1357.

*Summary of data for Rio Grande project to end of fiscal year 1922—Continued.*

	Calendar year 1921.	To Dec. 31, 1921.	Fiscal year 1922.	To June 30, 1922.
Net operation and maintenance cost.....	\$233,754.42	\$233,754.42	\$216,372.60	\$366,808.52
Less—				
Charges billed or contracted.....	232,724.10	232,724.10	83,318.50	282,724.10
Penalties and discounts (net).....	*2,704.12	*2,704.12	*422.57	*3,109.31
Total.....	280,019.98	230,019.98	82,985.93	229,614.79
Balance.....	3,734.44	3,734.44	133,476.67	137,193.73

	Reclamation fund.	Rio Grande Dam.	Increase of compensation.	Total.
Investment to date:				
Disbursements and net transfers.....	\$12,379,762.25	\$1,009,000.00	\$363,608.90	\$13,743,371.15
Less collections.....	1,814,727.18			1,814,727.18
Net investment.....	10,565,035.07	1,009,000.00	363,608.90	11,928,643.97

\*Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost: Funds advanced for construction.....	\$5,000.00	\$5,000.00				\$5,000.00
To return net operation and maintenance cost: Operation and maintenance charges project lands, 150,000 acres.....	216,605.50	216,605.50	\$142,500.00	\$212,119.06	\$4,496.44	
Penalties and interest.....	1,228.11	1,377.13	1,228.11	1,377.13		
Total.....	217,833.61	217,982.63	143,728.11	213,496.19	4,496.44	
Revenues:						
Rentals of irrigating water.....	1,575.00	1,090,101.25	57,432.31	1,043,848.57		46,252.68
Rentals of power and light.....		2,243.33		2,243.33		
Rentals of grazing and farming lands.....	446.45	1,512.00	446.45	1,504.00		8.00
Total.....	2,021.45	1,093,856.58	57,878.76	1,047,595.90		46,260.68
Other miscellaneous collections.....			28,554.20	533,635.09		2,780.64
Miscellaneous uncollected.....						
Grand total collections.....			230,161.07	1,814,727.18		

**ACTIVITIES DURING FISCAL YEAR.**

*Storage.*—Concreting on the spillway channel at Elephant Butte Dam was begun about July 1, 1921, and was completed in November, 7,785 cubic yards of concrete being placed from a chuting tower. The upper and lower east balanced valve plugs were replaced with new ones having removable bronze downstream face, the original semisteel plugs having become pitted through.

*Canal system.*—During the nonirrigation season the Leasburg Canal extension was completed following a portion of the Dona Ana lateral and wasteway so that approximately 3 miles of the old Las Cruces and Mesilla ditches were eliminated. Six thousand feet of the West Side Canal were lined above the Chamberino lateral heading and the banks raised for 2 miles. The Franklin Canal was enlarged from the Franklin feeder junction to the Island feeder, which was also enlarged and raised.

*Lateral system.*—One Ruth ditching machine operated the entire year completing the Las Cruces system including sublaterals and about 60 per cent of the Mesilla system; an additional machine received during the spring completed about 75 per cent of the Three Saints lateral system. Lateral construction by drag-line excavators included 2,000 feet of the Las Cruces lateral moved off the railroad right of way, the extension of the Hill lateral, the Santo Tomas, Brazito, Baca, and River laterals, a portion of the Del Rio lateral, Mesilla wasteway, and a portion of the Brown lateral, a section of the Dona Ana wasteway, and the lower end of the Anthony lateral. Construction under small earthwork contracts consisted of the Cooney, Rowley, Zach, and Stevens laterals and a section of the Taylor, Baker, and La Union East laterals. In the El Paso Valley construction of the lower end of the Salatrall lateral and the reconstruction of the Ysla and Y-303 laterals were completed by the P. & H. 206 excavator. The Jornada lateral was reconstructed by Government forces, and a Ruth ditching machine completed the San Elizario lateral.

*Drainage system.*—In the Mesilla Valley the Monighan 2-T drag line worked throughout the year on the Del Rio drain, except during the construction of the Mesilla wasteway. One Bucyrus  $9\frac{1}{2}$  drag line completed the Dona Ana drain, worked on the Leasburg Canal extension during the nonirrigation season, constructed the Shalem drain, and resumed the construction of the Selden drain. Another Bucyrus  $9\frac{1}{2}$  completed the Santo Tomas drain and Santo Tomas lateral, worked on the West Side Canal bank raising during the nonirrigation season, and began the construction of the Picacho drain on February 1. The two P. & H. 206 drag lines were diverted from lateral construction for short intervals for the construction of the Lake and Shalem spur drains. In all 19.1 miles of drain were constructed in the Mesilla Valley. In the El Paso Valley one Bucyrus  $9\frac{1}{2}$  drag line continued the construction of the Border drain and the other  $9\frac{1}{2}$  excavator completed the Playa drain and cleaned a portion of the Mesa drain. The Jennings Construction & Engineering Co. completed their contract for the second schedule of the Tornillo drain on March 24 and the construction of this drain was resumed by the Bucyrus 30-B drag line. In the El Paso Valley 13.5 miles of drain were constructed.

*Operation and maintenance.*—During the year 1921 the Reclamation Service delivered water to 84,450 acres on the project on a rental basis under contract with the two irrigation districts, the districts being billed for the estimated cost of operation and maintenance for the year. Practically all cleaning was done under small earthwork contracts. Portions of the Mesa and Middle drains in the El Paso Valley were cleared by drag line.

*Operation data Rio Grande project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	85,000	88,000	92,800	107,000	109,000	109,000
Acreage irrigated.....	62,513	64,308	64,781	70,000	<sup>1</sup> 73,346	<sup>2</sup> 85,580
Miles canal operated.....	75	86	153	385	546	586
Water diverted (acre-feet).....	<sup>3</sup> 420,646	<sup>3</sup> 622,177	<sup>3</sup> 613,638	<sup>3</sup> 603,711	<sup>3</sup> 677,953	<sup>3</sup> 782,366
Water delivered to land (acre-feet).....			<sup>3</sup> 348,295	<sup>3</sup> 174,945	<sup>3</sup> 226,464	<sup>3</sup> 197,086
Per acre of land irrigated (acre-feet).....	6.73	8.0	5.37	2.5	2.95	2.56

<sup>1</sup> Land irrigated through Government operated distribution system only does not include approximately 10,000 acres in Picacho, Island, and Tornillo still irrigating from community ditch diverting direct from the river.

<sup>2</sup> Includes 1,120 acres in Fort Hancock.

<sup>3</sup> Measured at point of delivery from canals.

<sup>4</sup> Total diversions, including water wasted and rediverted from river below.

<sup>5</sup> Includes delivery to farms by U. S. Reclamation Service operation and to heads of community ditches on project.

*Settlement data, Rio Grande project.*

	1917	1918	1919	1920	1921
Total number of farms.....	1,700	2,287	2,703	3,021	3,204
Population.....	10,500	10,259	12,890	12,199	11,774
Number of irrigated farms.....	1,700	2,287	2,703	3,021	3,222
Operated by owners.....	1,170	1,377	1,966	2,668	2,628
Operated by tenants.....	530	910	737	353	594
Number of towns.....	25	27	27	29	29
Population.....	86,600	87,997	89,316	<sup>1</sup> 100,235	101,235
Total population in towns and on farms.....	97,100	98,256	102,206	112,434	113,009
Number of public schools.....	52	52	54	102	103
Number of churches.....	81	82	83	105	106
Number of banks.....	18	18	17	14	13
Total amount of capital stock.....	\$3,000,000	\$3,000,000	\$3,250,000	\$2,990,000	\$2,950,000
Amount of deposits.....	\$31,000,000	\$32,000,000	\$33,000,000	\$30,898,499	\$28,194,815
Number of depositors.....	40,000	40,000	44,000	31,716	30,000

<sup>1</sup> 5,000 soldiers included in El Paso's population.

## NORTH DAKOTA PUMPING PROJECT.

WILLIAM S. ARTHUR, project manager, Williston, N. Dak.

The North Dakota pumping project is located in Williams County, N. Dak., on the Great Northern Railway. Williston is the principal town and the project headquarters. The Missouri River is the source of water supply. The irrigation season is 80 days; the average rainfall is 13 inches; the average high temperature is 99° and the average low -37° F. The principal products are alfalfa, dairy cows and hogs, corn and potatoes. Public farm units are limited to 80 acres, and private to 160 acres.

A central steam power plant is located near Williston adjoining Government-owned coal lands, where electrical energy is generated for the operation of the pumping stations of which there are four. The plan of the Williston division provides for a series of motor-driven centrifugal pumps on a barge in the Missouri River, a settling basin receiving the water from the barge, a main canal of 90 second-feet capacity extending along Little Muddy Creek to the power plant where two sets of steam-driven turbines operate centrifugal pumps for the higher lifts. From the main canal about midway between the river and power plant electrically-driven pumps raise water 28 feet for the lands on the west side of Little Muddy Creek.

### SUMMARY OF DATA FOR NORTH DAKOTA PUMPING PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....	10,753	
Public land entered to June 30, 1922.....	254	
Public land open to entry on June 30, 1922.....	139	
State land unsold on June 30, 1922.....	23	
Private land, June 30, 1922.....	10,337	
Acreage service could supply, season of 1921.....	7,653	
Acreage irrigated, season of 1921.....	2,080	
Acreage cropped under irrigation, season of 1921.....	1,960	
Acreage dry-farmed, season of 1921.....	2,500	
Value of irrigated crops, season of 1921.....	\$54,320.00	
Value of irrigated crops per acre cropped.....	\$27.70	
Value of dry-farmed crops, season of 1921.....	\$22,500.00	
Value of dry-farmed crops per acre cropped.....	\$9.00	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$173,986.00	
Encumbrances, disbursements and liabilities.....	69,692.07	
Unencumbered balance July 1, 1922.....	\$104,293.93	
Fiscal year 1923; amount specified in appropriation act.....	115,000.00	

			Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>				
Net construction cost.....			* \$629.88	\$684,796.83
Less—				
Loss.....				301,299.10
Water-right contracts, project lands (7,653 acres).....				290,303.74
Total.....				592,102.84
Balance.....			* 629.88	92,693.99
	Calendar year 1921.	To Dec. 31, 1921.		
Net operation and maintenance cost.....	\$32,137.46	\$395,573.02	19,843.34	401,914.75
Less:				
Probable loss.....		<sup>1</sup> 249,816.59		249,816.59
Charges billed or contracted.....	31,342.12	144,893.61	18,790.48	150,809.40
Penalties and discounts (net).....	795.34	862.82	1,052.86	1,288.76
Total.....	32,137.46	395,573.02	19,843.34	401,914.75

\* Contra.

<sup>1</sup> Includes deficit on Buford Trenton division and on Williston division prior to Apr. 1, 1919.

*Summary of data for North Dakota pumping project to end of fiscal year 1922—Contd.*

	Reclamation fund.	Increase of compensation.	Total.
Investment to date:			
Disbursements and net transfers.....	\$1,429,414.07	\$19,815.39	\$1,449,229.46
Less collections.....	377,511.63		877,511.63
Net investment.....	1,051,902.44	19,815.39	1,071,717.83

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected—cash.		Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	
To return net construction cost:					
Construction water-right charges paid in advance.....				\$8,250.63	
To return net operation and maintenance cost:					
Operation and maintenance charges, project lands (6,693.40 acres).....	\$11,713.45	\$48,338.61	\$5,841.68	27,625.16	\$20,713.45
Penalties and interest.....	1,052.86	1,288.76	1,052.86	1,288.76	
Total.....	12,766.31	49,627.37	6,894.44	28,913.92	20,713.45
Revenues:					
Rentals of irrigating water.....		2,149.08		2,149.08	
Rentals of power and light.....	52,100.33	316,077.04	48,341.83	312,318.54	3,758.50
Total.....	52,100.33	318,226.07	48,341.83	314,467.57	3,758.50
Miscellaneous uncollected.....					27.61
Other miscellaneous collections.....			7,939.63	25,879.51	
Grand total collections.....			68,176.20	377,511.63	

### ACTIVITIES DURING FISCAL YEAR.

About 3 miles of small laterals were constructed to deliver water to lands not previously irrigated.

The commercial power contract with the city of Williston remained in force and the plant was in operation the entire year under this contract. During the year 1,090,500 kilowatt hours of electrical energy were delivered to the city. The chief value of the commercial power operations lies in their making it feasible to retain the principal part of an operating organization throughout the year. It would be impracticable to disband and assemble this type of organization each year.

For the operations of the power plant 13,122 tons of coal were mined in the coal mine, which is the only Government-operated coal mine in the United States. This coal cost \$26,427, or \$2.01 per ton. This represented a reduction of 57 cents per ton over the previous year and 74 cents per ton under the average coal-mining costs of the community.

*Operation data, Williston division, North Dakota pumping project.*

Item.	1919	1920	1921
Area for which service was prepared to supply water.....	8,189	7,653	7,653
Acreage irrigated.....	2,446	2,810	2,080
Miles of canal operated.....	31	31	35
Water diverted (acre-feet).....	4,028	4,600	2,373
Water delivered to land (acre-feet).....	2,633	2,684	1,624
Water per acre of land irrigated (acre-feet).....	1.08	0.97	0.75

**SETTLEMENT.**

There is no public land available for entry at present. The Williston irrigation district has inaugurated a campaign to reduce the size of private land holdings and correspondingly increase the settlement. Farmers of small tracts devoted to diversified crops are very successful.

*Settlement data, Williston division, North Dakota pumping project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	101	106	105	106	105	105
Population.....	175	190	195	200	200	210
Total number of irrigated farms.....					94	76
Operated by owners or managers.....	34	34	33	33	47	30
Operated by tenants.....	10	10	11	24	19	12
Operated by nonresidents.....					28	25
Population.....	152	155	160	181	194	200
Number of towns.....	2	2	2	2	2	2
Population.....	5,000	5,300	5,360	5,400	5,000	5,000
Population in towns and on farms.....	5,175	5,490	5,555	5,600	5,200	5,210
Number of public schools.....	5	6	6	6	6	6
Number of churches.....	6	6	6	6	6	7
Number of banks.....	3	4	4	4	3	3
Total capital stock.....	\$185,000	\$235,000	\$260,000	\$260,000	\$260,000	\$260,000
Amount of deposits.....	\$1,500,000	\$1,800,000	\$2,000,000	\$1,750,000	\$2,000,000	\$1,800,000
Number of depositors.....	3,300	3,500	3,800	3,600	5,010	3,600

## OREGON, UMATILLA PROJECT.

H. M. SCHILLING, project manager, Hermiston, Oreg.

The Umatilla project is located in Umatilla and Morrow Counties and is traversed by the main line railroad of the Oregon-Washington Railroad & Navigation Co. The project towns are Hermiston, Umatilla, Irrigon, and Boardman. The source of water supply is the Umatilla River. The average elevation of the irrigable area is 470 feet above sea level, the average rainfall for 18 years is 8.71 inches, and the length of the irrigation season is 210 days. The principal products are alfalfa, fruits, vegetables, honey, and dairy produce.

The irrigation plan of the East division of the project provides for the diversion of water from the Umatilla River above Echo, Oreg., through a feed canal 24.5 miles in length to the Cold Springs Reservoir which has a storage capacity of 50,000 acre-feet, and from which it is delivered directly to the land through a system of canals and laterals. Water is also diverted from the Umatilla River near the mouth of Butter Creek by the Maxwell Canal and when available supplements the discharge from the reservoir. For the West division water is diverted from the Umatilla River about half way between Hermiston and Umatilla and is delivered directly to lands bordering the Columbia River in the vicinity of Umatilla, Irrigon, and Boardman.

### SUMMARY OF GENERAL DATA FOR UMATILLA PROJECT TO END ON FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		28,800
Public land entered to June 30, 1922.....	5,360	
Public land open to entry on June 30, 1922.....	97	
Public land withdrawn on June 30, 1922.....	2,376	
Railroad land unsold on June 30, 1922.....	3,319	
Other private land, June 30, 1922.....	17,146	
Acreage service could supply, season of 1921.....		24,400
Acreage irrigated, season of 1921.....		13,150
Acreage cropped under irrigation, season of 1921.....		11,610
Value of irrigated crops, season of 1921.....		\$343,890
Value of irrigated crops per acre cropped.....		\$29.32
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$478,752.66	
Encumbrances, disbursements and liabilities.....	186,037.17	
Unencumbered balance July 1, 1922.....		\$342,715.49
Fiscal year 1923, amount specified in appropriation act.....		509,000.00

		Fiscal year 1923.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$221,223.79	\$2,798,885.14
Less water-right contracts—			
Project lands (24,040 acres).....		1,012,208.02	2,662,304.49
Other lands (120 acres).....			4,800.00
Total.....		1,012,208.02	2,667,104.49
Balance.....		*790,984.25	111,780.65
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$43,709.78	\$290,782.91	34,617.97
Less:			
Charges billed or contracted.....	52,012.86	295,449.64	51,984.22
Penalties and discounts (net).....	192.43	2,969.13	774.86
Total.....	52,205.29	298,418.77	52,759.07
Balance.....	*8,495.61	*7,533.86	*18,141.10
			9,662.38

\* Contra.



*Summary of general data for Umatilla project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Increase of compensation.	Total.
Investment to date:			
Disbursements and net transfers.....	\$3,258,599.11	\$32,334.05	\$3,290,933.16
Less collections.....	733,570.24	.....	733,570.24
Net investment.....	2,525,028.87	32,334.05	2,557,362.92

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....	\$29,225.00	\$341,490.34	\$8,101.94	\$305,015.47	.....	\$36,474.87
Construction water-right charges paid in advance.....	.....	.....	.....	19,253.07	.....	.....
To return net operation and maintenance cost:						
Operation and mainte- nance charges, project lands (24,400 acres).....	26,349.98	250,934.13	24,217.38	214,177.74	\$3,277.56	33,478.83
Penalties and interest.....	1,041.17	6,921.54	1,041.17	6,921.54	.....	.....
Total.....	27,391.15	257,855.67	25,258.55	221,099.28	3,277.56	33,478.83
Operation and maintenance charges paid in advance.....	.....	.....	.....	534.96	.....	.....
Revenues:						
Rentals of irrigating water.....	2,674.05	30,786.09	1,125.89	29,810.05	609.42	306.62
Rentals of grazing and farming lands.....	331.55	1,008.60	331.55	1,008.60	.....	.....
Total.....	3,005.60	31,794.69	1,457.44	30,818.65	609.42	306.62
Miscellaneous uncollected.....	.....	.....	.....	156,848.81	.....	871.53
Other miscellaneous collections.....	.....	.....	6,092.67	.....	.....	.....
Grand total collections.....	.....	.....	40,910.60	733,570.24	.....	.....

**ACTIVITIES DURING FISCAL YEAR.**

*East division.*—The principal construction work in progress was the continuation of the improvement of the A Canal, of which 2.6 miles were enlarged and lined, involving the excavation of 15,000 cubic yards of material and the placing of 3,000 cubic yards of concrete lining. In addition a by-pass canal of 50 second-feet capacity and 700 feet long was built from the A Canal to the Maxwell Canal.

In connection with betterments to the irrigation system as provided in the contract with the Hermiston irrigation district the D1 pipe was extended to take water from the Maxwell Canal instead of from the C Canal, thus adding considerably to its capacity. In addition about 1,700 feet of canal between D1 and D2 pipes were enlarged and lined with concrete and the canal below D2 pipes was enlarged. Four short pipe lines were built from the Maxwell Canal to turnouts formerly delivering from the C Canal, thus permitting the abandonment of about 2 miles of the latter from which excessive seepage formerly occurred.

The construction of lateral extensions was continued, about 3.3 miles of lateral being built, 4,845 linear feet of 16-inch and 2,150 linear feet of 12-inch concrete pipe were laid, and 175 cubic yards of concrete lining were placed. All pipe used was manufactured by Government forces.

*West division.*—Lateral construction, both original and supplemental construction, was carried on intermittently throughout the year. One mile of lateral was built involving the laying of 4,300 linear feet of 12-inch, 15-inch, and 16-inch concrete pipe and the placing of 511 cubic yards of concrete lining.

*Operation and maintenance.*—East division. Diversions for the feed canal for storage were from November 27, 1921, to June 17, 1922. From December 19, 1921, to February 4, 1922, severe weather caused ice to form in the canal, making operations intermittent. Floods in Stage Gulch during February caused by quick melting of snow on a frozen surface again interfered with operations. To counterbalance the intermittent service of the feed canal, Cold Springs Canyon and Despain Gulch discharged flood water amounting to 9,036 acre-feet into Cold Springs Reservoir. The maximum storage of 49,700 acre-feet was reached June 11, 1922. Available storage on June 30, 1922, was 43,400 acre-feet. Delivery of water to the distribution system was from July 1 to October 17, 1921, and began on April 1, 1922. West division. Diversions of water by the Main Canal for irrigation were from July 1 to October 31, 1921, and began on April 1, 1922.

*Operation data, Umatilla project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Area for which service was prepared to supply water.....	19,000	24,247	24,300	24,300	24,395	24,400
Miles of canal operated.....	163	165	177	177	177	177
Acreage irrigated.....	5,900	7,327	9,100	10,533	12,030	13,150
Water diverted (acre-feet).....	93,000	99,900	118,154	162,850	165,534	180,872
Water delivered to land (acre-feet).....	34,380	45,365	48,163	53,500	50,651	57,482
Per acre of land irrigated, (acre-feet).....	5.83	6.10	5.61	5.10	4.21	4.37

*Settlement data, Umatilla project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	800	869	875	1,000	1,000
Population.....	1,024	1,127	1,200	1,472	1,562
Number of irrigated farms.....	411	459	500	528	544
Operated by owners or managers.....	302	339	350	450	442
Operated by tenants.....	109	120	150	78	102
Population.....	1,024	1,200	1,200	1,280	1,562
Number of towns.....	4	4	4	4	4
Population.....	1,100	1,200	1,200	1,280	1,280
Population in towns and farms.....	2,124	2,327	2,400	2,752	2,842
Number of public schools.....	6	6	6	6	6
Number of churches.....	9	9	9	9	9
Number of banks.....	1	1	1	1	1
Capital stock.....	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Amount of deposits.....	\$157,000	\$170,000	\$232,000	\$217,580	\$235,367
Number of depositors.....	960	1,000	1,129	1,200	1,200

# OREGON-CALIFORNIA, KLAMATH PROJECT.

Herbert D. Newell, project manager, Klamath Falls, Oreg.

The Klamath project is located in Southern Oregon and Northern California. The project is served by the Southern Pacific and the Oregon California and Eastern Railroads; Klamath Falls with a population of about 5,500 is the principal project city, is the center of an extensive lumber industry, and as a shipping point ranks second in the State.

The average elevation of the irrigable lands is about 4,100 feet above sea level. The principal agricultural products are alfalfa and grain; stock raising is practiced to a large extent; the dairying industry, begun several years ago, is increasing rapidly. The principal markets are Portland, Oreg., Sacramento and San Francisco, Calif. The irrigation season usually begins about May 1, and ends on September 30.

The project derives its water supply principally from the Upper Klamath Lake which is situated just north of Klamath Falls. Water for irrigation is diverted into the Main Canal at the lower end of the lake; a short distance below the point of diversion the Main Canal passes under the city of Klamath Falls by means of a concrete-lined tunnel, 3,300 feet in length.

An important feature of the project is the reclamation of the bed of Tule Lake; The lands are first uncovered by causing the waters to recede; later the necessary irrigation works will be constructed. Tule Lake has no visible outlet; the lake-bed lands are being uncovered by the prevention of inflow and by evaporation. The principal works designed to prevent inflow are the Clear Lake Reservoir and the Lost River diversion canal. Clear Lake is located on the headwaters of Lost River and is in effect an evaporating basin covering an area of about 25,000 acres; surplus storage is available for the irrigation of about 12,000 acres in Langell Valley. The diversion canal connects Lost River with the Klamath River; this canal diverts water entering Lost River below the Clear Lake Dam to the Klamath River.

## SUMMARY OF DATA FOR KLAMATH PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		140,880
Public land entered to June 30, 1922.....	2,748	
Public land withdrawn on June 30, 1922.....	27,300	
Private land, June 30, 1922.....	110,832	
Acreage service could supply, season of 1921.....		51,000
Acreage irrigated, season of 1921.....		134,100
Acreage cropped under irrigation, season of 1921.....		32,720
Value of irrigated crops, season of 1921.....		\$431,936.00
Value of irrigated crops, per acre cropped.....		\$13.20
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year, 1922, all congressional authorizations.....	\$1,261,263.04	
Encumbrances, disbursements, and liabilities.....	350,659.53	
Unencumbered balance, July 1, 1922.....		\$870,573.51
Fiscal year 1923, amount specified in appropriation act.....		700,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$403,468.58	\$3,540,333.94
Less water-right contracts—			
Project lands (42,142 acres).....		2,306.20	1,820,743.30
Warren Act lands (approximately 40,029 acres).....		51,048.44	142,605.34
Other lands (approximately 22,072 acres).....		*4,981.58	133,988.40
Total.....		48,372.15	2,097,296.94
Balance.....		355,096.43	1,443,036.90
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$65,380.20	\$502,722.91	44,831.28
Less:			
Charges billed or contracted.....	73,646.50	515,396.08	62,535.38
Penalties and discounts (net).....	27.78	*2,652.57	864.43
Total.....	73,674.28	512,743.51	63,399.81
Balance.....	*8,294.08	*10,020.60	*18,563.53
			23,039.38

\* Contra.

1 Total irrigated area, 44,883 acres, including 8,783 acres of Van Brimmer lands and in miscellaneous pumping divisions.

Summary of data for Klamath project to end of fiscal year 1922—Continued.

	Reclamation fund.	Increase of compensation.	Total.
Investment to date:			
Disbursements and net transfers.....	\$4,323,031.12	\$53,965.98	\$4,376,997.10
Less collections.....	1,086,417.97		1,086,417.97
Net investment.....	3,236,613.15	53,965.98	3,290,579.13

Status of current accounts receivable as of June 30, 1922.

	Due.		Collected.			Uncollected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....	\$27,737.23	\$302,285.70	\$41,613.58	\$475,896.73	.....	\$26,388.97
Construction water-right charges paid in advance...	.....	.....	.....	322.61	.....	.....
To return net operation and maintenance costs:						
Operation and maintenance charges—						
Project lands (42,142 acres).....	37,642.51	427,427.95	63,826.17	359,614.68	\$30,014.15	37,799.12
Warren Act lands (ap- proximately 8,335 acres).....	602.72	1,459.36	526.40	1,383.04	.....	76.32
Other lands (approx- imately 5,000 acres).....	*10,911.12	200.00	*8,333.34	.....	.....	200.00
Penalties and interest.....	916.23	2,623.78	916.23	2,623.78	.....	.....
Total.....	28,250.34	431,711.09	56,985.46	363,621.50	30,014.15	38,075.44
Operation and maintenance charges paid in advance.....	.....	.....	.....	107.90	.....	.....
Revenues:						
Rentals of irrigating water.....	1,241.14	42,189.62	734.30	41,665.96	.....	523.06
Rentals of power and light.....	1,000.00	6,020.00	1,000.00	6,020.00	.....	.....
Rentals of grazing and farming lands.....	2,919.30	15,352.49	2,879.30	12,655.77	.....	2,696.72
Total.....	5,160.44	63,562.11	4,613.60	60,341.73	.....	3,220.38
Miscellaneous uncollected.....	.....	.....	.....	.....	.....	2,423.02
Other miscellaneous collections.....	.....	.....	26,644.19	186,127.50	.....	.....
Grand total collections...	.....	.....	128,806.83	1,066,417.97	.....	.....

\* Contra.

ACTIVITIES DURING FISCAL YEAR.

On the C Canal, the old timber flume was replaced with a reinforced precast concrete flume 4,316 feet long. The waterway is 11 feet wide and 6 feet high; the flume is supported on concrete bents averaging about 10 feet in height, spaced at intervals of 12 feet. The precast units were cast at the side of the old timber flume during the irrigation season of 1921. After the irrigating season, the old timber flume was dismantled and the new flume erected. At the lower end the flume connects with a concrete-lined canal 7,600 feet long.

The C-G Canal is about 4,500 feet along and connects the C and G Canals; its purpose is to provide a new method of supply for the G Canal and to supply water for the Tule Lake division. The canal

excavation, the headworks, and the drop at the upper end of the canal were completed prior to June 30, 1921. The Lost River structures, consisting of the inlet, outlets, and three pipe lines each 6 feet 3 inches in diameter, were constructed during the latter part of 1921. One of the pipe lines crosses Lost River and supplies the G Canal; another discharges water into Lost River for the Tule Lake lands; and the third will discharge to the diversion canal and will be used only in an emergency.

For the Tule Lake division, a diversion dam was constructed on Lost River about 2 miles east of Merrill, Oreg. The diversion dam is of the Ambursen type and is constructed of reinforced concrete. The J Canal will supply the Tule Lake lands; to June 30, 1922, this canal had been constructed for a distance of about 8.5 miles or nearly to the Oregon-California boundary. During the forepart of 1922, work was begun on the Tule Lake lateral system; 5 miles of laterals had been constructed to June 30. The excavation on both the canal and lateral system was being done by drag-line excavators. The canal structures will be of concrete and most of the lateral structures of redwood lumber.

The canal and lateral system for the Tule Lake division has been designed to serve an area of about 25,000 acres. All of the land reclaimed from the bed of Tule Lake is in public ownership and will be available for soldier settlement.

In the Langell Valley division, field surveys were begun early in May, 1922. During June a construction camp was established near the Langell Diversion Dam. Construction of the dam and of the West Side Canal was begun shortly after July 1, 1922, and should be completed prior to June 30, 1923. The dam will be constructed by Government forces and most of the canal by contract.

*Operation data, Klamath project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	40,000	44,000	50,000	50,000	50,000	51,000
Acreage irrigated.....	29,351	33,635	38,269	42,881	44,800	44,888
Miles of canal operated.....	216	216	210	225	225	225
Water diverted (acre-feet).....	66,010	66,368	104,926	119,880	114,179	108,104
Water delivered (acre-feet).....	29,970	32,780	52,090	66,490	48,754	48,713
Per acre of land (acre-feet).....	1.02	0.975	1.36	1.32	1.11	1.11

<sup>1</sup> Includes 8,783 acres of Van Brimmer lands and in miscellaneous pumping divisions.

*Settlement data, Klamath project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	527	560	670	570	570
Population.....	1,610	1,800	2,000	2,050	2,200
Number of irrigated farms.....	527	530	540	548	543
Operated by owners or managers.....	336	340	350	352	480
Operated by tenants.....	191	190	190	190	113
Population.....	1,490	1,510	1,600	1,650	1,720
Number of towns.....	4	4	5	5	5
Population.....	4,800	5,000	5,300	5,500	5,800
Total population, towns and farms.....	6,410	6,800	7,300	7,550	8,000
Number of public schools.....	20	20	21	21	22
Number of churches.....	9	10	10	10	10
Number of banks.....	3	4	5	6	5
Total capital stock.....	\$175,000	\$225,000	\$500,000	\$585,000	\$545,000
Amount of deposits.....	\$1,390,000	\$2,383,000	\$4,000,000	\$4,504,000	\$3,500,000
Number of depositors.....	5,310	6,264	6,500	9,250	8,000

# SOUTH DAKOTA, BELLE FOURCHE PROJECT.

B. E. HAYDEN, project manager, Newell, S. Dak.

The Belle Fourche project is located in western South Dakota a little north and east of the Black Hills. The district is served by the Chicago & North Western Railway, which runs into the heart of the project, and the Burlington Railway, which runs into the Black Hills. The principal towns are Belle Fourche, Newell, Nisland, and Fruitdale. The source of water supply is the Belle Fourche River. The climate is semiarid, with an average annual rainfall of about 14 inches; the temperature ranges from -38° to 105° F. The character of the soils varies from light sandy loam to heavy clay, the clay soils predominating. The duty of water averages 1.5 acre-feet per acre. The principal products are alfalfa, wheat, oats, corn, potatoes, sugar beets, garden truck, and live stock, the chief markets for which are Omaha, Minneapolis, and Chicago.

The irrigation plan provides for the diversion of water from the Belle Fourche River by means of a dam about 1½ miles below Belle Fourche, S. Dak., and an inlet or supply canal about 6½ miles in length into a storage reservoir controlled by the Belle Fourche Dam on Owl Creek, a tributary of the Belle Fourche River; the distribution of water from the inlet canal to a small area of land and the distribution of water from the reservoir through two canal systems to lands on both sides of the Belle Fourche River.

## SUMMARY OF DATA FOR BELLE FOURCHE PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		96,800
Public land entered to June 30, 1922.....	\$7,427	
Public land open to entry on June 30, 1922.....	117	
Public land withdrawn on June 30, 1922.....	6,973	
State land unsold on June 30, 1922.....	501	
Other private land, June 30, 1922.....	51,982	
Acreage service could supply, season 1921.....		82,328
Acreage irrigated, season of 1921.....		55,100
Acreage cropped under irrigation, season of 1921.....		55,100
Value of irrigated crops, season of 1921.....	\$513,750.00	
Value of irrigated crops per acre cropped.....		\$9.32
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$538,365.02	
Encumbrances, disbursements, and liabilities.....	126,840.29	
Unencumbered balance July 1, 1922.....		\$406,524.73
Fiscal year 1922, amount specified in appropriation act.....		\$60,000.00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$85,628.36	\$3,544,640.69
<b>Less water-right contracts—</b>			
Project lands (76,914.93 acres).....		1,215.06	2,616,175.69
Warren Act lands (54.3 acres).....			1,671.40
Total.....		1,215.06	2,617,847.09
Balance.....		\$4,413.30	\$80,842.60
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$129,322.92	\$866,792.03	94,404.67
<b>Less:</b>			
Charges billed or contracted.....	147,339.67	772,305.88	148,497.49
Penalties and discounts (net).....	* 265.71	2,128.01	509.93
Total.....	147,605.38	774,433.89	149,007.42
Balance.....	* 17,717.54	92,358.14	* 54,602.75
			120,785.12

\* Contra.

Summary of data for Belle Fourche project to end of fiscal year 1922—Continued.

	Reclamation fund.	Judgments Court of Claims.	Increase of compensation.	Total.
Investment to date:				
Disbursements and net transfers .....	\$4,490,499.95	\$37,170.22	\$41,118.64	\$4,568,788.81
Less collections .....	1,040,983.62			1,040,983.62
Net investment .....	3,449,516.33	37,170.22	41,118.64	3,527,806.19

	Due.		Collected.			Uncollected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges .....	\$110,686.19	\$631,207.56	\$36,000.00	\$462,924.77	\$11.08	\$168,271.71
Construction water-right charges paid in advance .....				407.88		
To return net operation and maintenance cost:						
Operation and maintenance charges—						
Project lands (76,914.93 acres) .....	148,387.89	771,765.53	36,390.15	496,008.44	11,938.72	263,818.37
Warren Act lands (54.8 acres) .....	109.60	352.56		46.00		306.56
Penalties and interest .....	1,539.29	14,322.37	1,505.23	14,283.31	34.06	
Total .....	150,036.78	786,440.46	37,895.38	510,342.75	11,972.78	264,124.93
Operation and maintenance charges paid in advance .....				245.86		
Revenues, rentals of irrigating water .....	793.16	4,651.38	793.16	4,501.38		180.00
Miscellaneous uncollected .....						192.90
Other miscellaneous collections .....			4,471.52	62,500.98		
Grand total collections .....			62,100.06	1,040,983.62		

## ACTIVITIES DURING FISCAL YEAR.

The excavation for Willow Creek laterals was completed on November 19, 1921. Field surveys and office computation were made of irrigable areas in the Willow Creek district.

Seepage encroachments during the year were slight although noticeable; 3,921 acres have been relieved temporarily of charges on account of becoming nonproductive. The question of a comprehensive drainage system for the project is receiving consideration.

The season of 1921 demonstrated the necessity of irrigation. Water was turned into the canals on May 2 and run continuously until September 25. Precipitation for the year was 10.2 inches, or about 70 per cent of normal. The total flow of the Belle Fourche River for the year was 166,789 acre-feet, compared with a flow of 506,389 acre-feet the previous year. Storage in the Belle Fourche Reservoir on June 30 was 158,380 acre-feet. The last killing frost in the spring occurred on May 15 and the first in the fall on September 30.

The Ruth excavator was put at cleaning canals on July 29 and worked until November 18. It moved during that time 26,907 cubic yards of material at a cost of 7.5 cents per cubic yard.

The better prices received for fat lambs, hogs, and cattle gave considerable encouragement to the farmers and overcame to a certain extent the depression of the previous two years. Grain crops were light and hay found little market until late in the winter. Alfalfa continues to be the principal crop and comprises about 45 per cent of the irrigated area. Wheat, oats, and corn each represent about 10 per cent of the irrigated acreage.

*Operation data, Belle Fourche project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	78,501	89,335	82,862	82,634	82,480	83,328
Acreage irrigated.....	48,468	51,009	52,445	56,638	50,850	55,109
Miles of canal operated.....	529	612	612	615	615	615
Water diverted (acre-feet).....	58,395	171,749	190,844	121,283	101,113	141,608
Water delivered to farms (acre-feet).....	39,133	61,184	61,731	82,400	36,616	71,715
Per acre of land irrigated (acre-feet).....	0.81	1.21	0.99	1.46	0.61	1.3

*Settlement data, Belle Fourche project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	1,292	1,292	1,292	1,292	1,292
Population.....	2,400	2,675	2,675	2,700	2,700
Number of irrigated farms.....	814	908	1,000	1,024	1,033
Operated by owners or managers.....	853	590	668	662	451
Operated by tenants.....	290	816	332	332	582
Population.....	2,150	2,424	2,597	2,650	2,510
Number of towns.....	5	5	5	5	5
Population.....	1,845	2,100	2,200	2,350	2,386
Total population in towns and on farms.....	4,245	4,775	4,875	5,000	5,086
Number of public schools.....	23	24	24	26	24
Number of churches.....	11	11	11	9	9
Number of banks.....	9	9	9	9	9
Total capital stock.....	\$140,000			\$250,000	\$250,000
Amount of deposits.....	\$2,205,993	\$2,391,262	\$3,557,080	\$2,657,621	\$2,373,380
Number of depositors.....				6,580	



## UTAH, STRAWBERRY VALLEY PROJECT.

W. L. WHITTEMORE, project manager, Provo, Utah.

The Strawberry Valley Project is located in the north central part of Utah; the irrigable area lies along the southeastern shore of Utah Lake, in Utah County, and the storage works in Wasatch County, 30 miles east of Springville. The irrigation plan provides for the storage of water in Strawberry Reservoir, the carriage of these stored waters through Strawberry Tunnel, approximately 4 miles long, into Diamond Fork, a tributary of the Spanish Fork River, and the diversion of water from this stream through canal systems to the irrigable area.

The length of the irrigation season is 169 days, from April 15 to September 30. The average elevation of the project lands is about 4,600 feet above sea level. The average rainfall at Payson for a period of 16 years is 18½ inches, most of which occurs from September 1 to May 1. The climate is temperate, varying from 95° F. in summer to 0° F. in winter. The last killing frost in the spring usually occurs prior to May 10, and the first in the fall after October 1. The soil varies from sandy loam to heavy clay and varying mixtures of both, to black alluvium and loam in the bottom lands. The mesa lands are sandy loam underlaid with gravel so that natural drainage is excellent. All soils are easily worked and extremely fertile if properly cultivated, and are suitable for raising any crop that will grow in the Temperate Zone. The principal crops are wheat, oats, barley, millet, alfalfa, timothy, sugar beets, potatoes, corn, cane, apples, plums, pears, peaches, prunes, apricots, cherries, melons, and all kinds of vegetables. The sugar beet, cereal, and hay crops constitute the staple crops under the project.

The project is traversed by two transcontinental railroad lines, the Denver & Rio Grande Western and the Los Angeles & Salt Lake (Union Pacific system). There is also a local electric interurban line connecting the main project towns with Salt Lake City and points in northern Utah.

### SUMMARY OF DATA FOR STRAWBERRY VALLEY PROJECT TO END OF FISCAL YEAR 1922.

#### Areas and crops:

Irrigable acreage when project is complete.....		55,389
Public land entered to June 30, 1922.....	1,953	
Other private land, June 30, 1922.....	53,436	
Acreage service could supply, season of 1921.....		53,899
Acreage irrigated, season of 1921.....		13 47,498
Acreage cropped under irrigation, season of 1921.....		13 47,167
Value of irrigated crops, season of 1921.....		14 \$1,557,099.00
Value of irrigated crops per acre cropped.....		14 \$33.00

#### Finances:

Appropriations—		
Fiscal year 1922, all congressional authorizations.....	\$186,767.37	
Encumbrances; disbursements and liabilities.....	85,060.98	
Unencumbered balance July 1, 1922.....		\$101,716.39
Fiscal year 1923; amount specified in appropriation act.....		85,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	*\$8,365.16	\$3,472,461.80
Less:		
Water-right contracts—		
Project (lands 19,143 acres).....	5,982.00	1,576,038.90
Warren Act lands (approximately 15,335 acres).....		644,580.00
Other lands (approximately 12,958 acres).....	1,188.00	862,380.47
Total.....	7,170.00	3,082,999.37
Balance.....	*\$15,535.16	389,462.43

<sup>1</sup> Includes High Line and Spanish Fork divisions, and Springville-Mapleton irrigation district.

<sup>2</sup> Project lands only, 32,500 acres.

<sup>3</sup> Project lands only, 31,380 acres.

<sup>4</sup> Project lands only, \$1,020,590.

<sup>5</sup> Project lands only, \$32.52.

<sup>6</sup> Contra.

Summary of data for Strawberry Valley project to end of fiscal year 1922—Continued.

	Calendar year 1921.	To Dec. 31, 1921.	Fiscal year 1922.	To June 30, 1922.
Net operation and maintenance cost.....	\$134,369.60	\$301,575.14	\$58,743.64	\$327,838.75
Less:				
Charges billed or contracted.....	63,078.45	216,301.87	70,061.99	223,363.31
Penalties and discounts (net).....	*1,264.30	*6,107.85	*679.32	*5,420.26
Total.....	61,814.15	210,194.02	69,382.67	217,933.06
Balance.....	72,555.54	91,381.12	*15,638.93	109,905.70

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensa- tion.	Total.
Investment to date:				
Disbursements and net transfers.....	\$4,118,806.02	\$440.00	\$27,570.70	\$4,146,816.72
Less collections.....	950,098.14			950,098.14
Net investment.....	3,168,707.88	440.00	27,570.70	3,196,718.58

\* Contra.

Status of current accounts receivable as of June 30, 1922.

	Due.		Collected.			Uncol- lected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....	\$68,099.76	\$355,824.97	\$63,484.23	\$313,689.35	.....	\$42,135.62
Construction water-right charges paid in advance.....				58.06	.....	.....
To return net operation and maintenance cost:						
Operation and maintenance charges—						
Project lands (19,143 acres.....	34,900.54	127,678.71	23,295.86	106,687.53	\$4,386.97	16,604.21
Warren Act lands (ap- proximately 15,335 acres).....	11,681.46	28,799.00	7,276.93	23,682.87	244.43	4,871.70
Other lands (approx- imately 12,958 acres.....	23,479.89	66,885.60	20,394.66	61,170.85	2,307.29	3,407.46
Penalties and interest.....	740.67	1,508.43	740.67	1,508.43	.....	.....
Total.....	70,802.56	224,871.74	51,708.12	193,049.68	6,938.69	24,883.37
Revenues:						
Rentals of irrigating water.....		8,388.39		8,388.39		
Rentals of power and light.....	22,035.51	103,087.41	23,137.72	101,468.70		1,618.71
Rentals of grazing and farming lands.....	12,165.60	120,530.66	12,165.60	120,530.66		
Total.....	34,201.11	232,006.46	35,303.32	230,387.75		1,618.71
Miscellaneous uncollected.....						467.30
Other miscellaneous collections.....			2,156.81	212,913.30		
Grand total collections.....			152,652.48	950,098.14		

## ACTIVITIES DURING FISCAL YEAR.

**Strawberry Tunnel.**—Work on repairs to Strawberry Tunnel was resumed during September, 1921, when the quarry at West Portal was reopened for obtaining concrete material. Major operations began on November 1 and continued without interruption until January 29, 1922, when repairs were completed. Between August, 1920, and January 29, 1922, 1,828 cubic yards of concrete were placed, 1,557 in putting in and strengthening 12,000 linear feet of floor and 271 in setting 148 reinforced concrete bays in sides.

**Strawberry Reservoir.**—On May 16, 1922, Strawberry Reservoir was filled for the third time since 1915.

**East Portal permanent camp.**—A 30-inch galvanized-iron ventilating pipe was installed during October, 1921, in the gate operating house to conduct air from Strawberry Tunnel through the roof of the building.

**Power Canal.**—A 10-foot radial gate was installed at the lower end of the upper plunge basin during the latter part of May, 1921, and a new concrete retaining wall constructed along the north side of the joint canal between the tail race and the wasteway during May, 1922.

**Water Users' Association.**—Active steps were taken to form a water users' association, embracing all water users who have purchased Strawberry water. The articles of incorporation of this company were filed with the secretary of state under the name of "Strawberry Water Users' Association." A tentative form of contract for taking over the care, operation, and maintenance of the project was submitted to the Director for approval.

## Operation data, Strawberry Valley project.

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	28,000	30,000	34,000	45,000	50,000	53,389
Acreage irrigated.....	25,000	28,147	32,539	44,300	45,450	47,436
Miles of canal operated.....	9.3	9.3	9.3	9.3	9.3	9.3
Water diverted (acre-feet).....	35,800	61,300	55,242	70,467	69,100	83,000
Water delivered to land (acre-feet) <sup>1</sup> .....	29,800	51,750	46,250	59,125	57,900	71,300
Per acre of land irrigated (acre-feet).....	1.18	1.84	1.42	1.33	1.27	1.50

<sup>1</sup> Includes High Line and Spanish Fork divisions and Springville-Mapleton irrigation district.

<sup>2</sup> 14,000 acre-feet of free water distributed.

<sup>3</sup> Estimated.

## Settlement data, Strawberry Valley project.

Item.	1920	1921
Total number of farms on project.....	3,000	3,200
Population.....	7,000	7,000
Number of irrigated farms.....	2,700	2,740
Operated by owners or managers.....	2,200	2,240
Operated by tenants.....	500	400
Population.....	6,500	6,300
Number of towns.....	12	12
Population.....	16,000	16,000
Total population of towns and farms.....	23,000	23,000
Number of public schools.....	22	22
Number of churches.....	23	23
Number of banks.....	6	6
Total capital stock.....	\$285,000	\$285,000
Total amount of deposits.....	\$2,180,000	\$1,750,000
Total number of depositors.....	9,830	10,000

## WASHINGTON, OKANOGAN PROJECT.

CALVIN CASTEEL, project manager, Okanogan, Wash.

The Okanogan project is located in Okanogan County, Wash., on a branch line of the Great Northern Railway running from Wenatchee to Oroville, Wash. Towns on the project are Okanogan, Omak, and Riverside. The source of water supply is Salmon Creek with storage in Conconully and Salmon Lake Reservoirs. Water is pumped from the Okanogan River by the Robinson Flat pumping plant, from Duck Lake by the Duck Lake pumping plant, and from two Government wells to supplement the flow of gravity water from Conconully and Salmon Lake Reservoirs. A pumping plant is also operated at the Salmon Lake Reservoir during dry years which pumps water from Salmon Lake below the elevation at which water can be secured by gravity flow.

The length of the irrigation season is from May 1 to September 30, 153 days. The average elevation is 1,000 feet above sea level; the average rainfall is about 11.5 inches; the temperature ranges from 108° F. to -10° F. The soil is volcanic ash and gravel on the upper benches and sand and gravel on the lowlands along the Okanogan River. The principal crop of the project is apples with some peaches, pears, small fruits, hay, and vegetables. The principal markets are the States east. The duty of water is 2½ acre-feet per acre per annum at the farm.

### SUMMARY OF DATA FOR OKANOGAN PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete (estimated).....	7,700	
Public land entered to June 30, 1922.....	116	
Private land, June 30, 1922.....	7,584	
Acreage service could supply, season of 1921.....	8,200	
Acreage irrigated, season of 1921.....	5,650	
Acreage cropped under irrigation, season of 1921.....	5,330	
Value of irrigated crops, season of 1921.....	\$2,051,270	
Value of irrigated crops per acre cropped.....	\$385	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$492,084.51	
Encumbrances, disbursements, and liabilities.....	114,987.86	
Unencumbered balance July 1, 1922.....	\$377,097.15	
Fiscal year 1923, amount specified in appropriation act.....	40,000.00	

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$162,566.48	\$1,398,067.67
Less water-right contracts, project lands (6,527 acres).....	200,000.00	1,503,003.29
<b>Balance.....</b>	<b>*\$27,441.52</b>	<b>*\$104,945.62</b>

	Calendar year 1921.	To Dec. 31, 1921.		
Net operation and maintenance cost.....	\$50,388.63	\$305,506.28	48,110.84	244,086.26
<b>Less:</b>				
Charges billed or contracted.....	45,028.12	203,511.94	45,231.62	203,426.44
Penalties and discounts (net).....	2,530.82	3,443.06	2,606.73	4,795.98
<b>Total.....</b>	<b>47,558.94</b>	<b>206,954.99</b>	<b>47,838.35</b>	<b>208,222.34</b>
<b>Balance.....</b>	<b>12,829.69</b>	<b>98,551.29</b>	<b>272.49</b>	<b>35,875.91</b>

	Reclamation fund.	Increase of compensation.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$1,719,659.07	\$41,804.29	\$1,761,463.36
Less collections.....	348,386.64		341,386.64
<b>Net investment.....</b>	<b>1,378,272.43</b>	<b>41,804.29</b>	<b>1,420,076.72</b>

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected, June 30 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost:						
Water-right charges.....	\$9,327.15	\$50,711.18	\$6,636.15	\$41,126.87	.....	\$9,584.31
Construction water-right charges paid in advance.....	.....	.....	.....	158.19	.....	.....
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands, (6,736 acres).....	50,104.42	184,976.03	46,899.34	165,799.58	\$2,541.11	16,645.34
Penalties and interest.....	2,545.20	5,154.93	2,530.46	4,612.48	542.45	.....
Total.....	52,649.62	190,130.96	49,429.80	170,402.06	3,083.56	16,645.34
Revenues:						
Rentals of irrigating water..	457.25	100,976.27	410.40	105,860.29	2,319.09	1,796.89
Rentals of power and light..	.....	1,754.71	.....	1,754.71	.....	.....
Rentals of grazing and farm- ing lands.....	86.00	672.50	86.00	672.50	.....	.....
Total.....	543.25	112,403.48	496.40	108,287.50	2,319.09	1,796.89
Miscellaneous uncollected.....	.....	.....	.....	.....	.....	1,507.35
Other miscellaneous collections.	.....	.....	3,928.57	21,412.02	.....	.....
Grand total collections.	.....	.....	60,490.92	341,386.64	.....	.....

**ACTIVITIES DURING FISCAL YEAR.**

Work on the Salmon Lake Dam and on the enlargement of Conconully Reservoir was completed in October, 1921. During the spring of 1922 electric pumping machinery was installed at the Duck Lake and Government wells pumping plants in place of the engine-driven outfits previously in use. A transmission line about  $3\frac{1}{4}$  miles in length was constructed and connected with the lines already in use. Approximately 11,900 linear feet of concrete lining were placed in the lateral system where losses from seepage had been excessive.

Water supply conditions were much better in 1921 than in 1920. An average of 2.96 acre-feet per irrigated acre was delivered to the project lands; the Robinson Flat pumping plant was operated during the entire season and the Duck Lake and Salmon Lake pumping plants for a short time each to supplement the supply of gravity water. There was a heavy snowfall during the winter of 1921-22, but owing to the cold windy spring a great deal of water was either carried off in the form of evaporation or disappeared in the ground on the watershed and not sufficient water was obtained to supply the project lands with the necessary amount from gravity flow. It is estimated that by pumping approximately 4,000 acre-feet from below the gate sill of Salmon Lake Reservoir the project lands under the gravity system will receive about 2 acre-feet per acre. At the end of the fiscal year the Salmon Lake pumping plant was being increased in size by the addition of the 125-horsepower engine formerly used at the Duck Lake pumping plant and a 20-inch pump to enable the plant to pump 4,000 acre-feet before the end of the irrigation season. In addition to the Salmon Lake pumping plant, the Duck Lake and Robinson Flat pumping plants and Government wells were in operation to augment the flow of gravity water from Conconully Reservoir.

*Operation data, Okanogan project, by calendar years.*

Item.	1917	1918	1919	1920	1921
Acreage for which the service was prepared to supply water.....	10,099	10,099	10,099	8,200	8,200
Acreage irrigated.....	8,000	6,402	5,849	5,440	5,650
Miles of canal operated.....	79	79	79	79	79
Water diverted (acre-feet).....	25,182	8,827	13,837	8,435	21,866
Water delivered to land (a re-feet).....	19,801	6,339	9,967	5,259	16,706
Per acre of irrigated land (acre-feet).....	2.49	0.99	1.70	0.96	2.96

*Settlement data, Okanogan project.*

Item.	1917	1918	1919	1920	1921
Total number of farms on project.....	560	594	594	594	439
Population.....	1,050	1,162	1,147	1,150	1,220
Number of irrigated farms.....	475	401	407	400	439
Operated by owners or managers.....	465	378	361	350	388
Operated by tenants.....	10	23	46	50	51
Population.....	1,050	1,162	1,147	1,150	1,220
Number of towns.....	3	3	3	3	3
Population.....	1,250	1,400	1,520	1,885	2,150
Total population in towns and on farms.....	2,300	2,562	2,667	3,035	3,370
Number of public schools.....	7	7	7	5	6
Number of churches.....	8	8	8	8	8
Number of banks.....	4	4	5	5	6
Total capital stock.....	\$135,000	\$135,000	\$160,000	\$155,000	\$155,000
Amount of deposits.....	\$450,000	\$500,000	\$600,000	\$1,050,100	\$1,043,000
Number of depositors.....	1,700	1,758	1,800	2,100	2,200

# WASHINGTON, YAKIMA PROJECT.

J. L. LYTTEL, project manager, Yakima, Wash.

The Yakima project, comprising the Sunnyside, Tieton, Kittitas, Moxee, Roza, and Kennewick divisions, is located in Kittitas, Yakima, and Benton Counties, Wash. The water supply comes from the Yakima River and its tributaries, supplemented by storage in Keechelus, Kachess, Cle Elum, Bumping, Tieton, and Clear Creek Reservoirs. Sunnyside division diverts water from the east side of the Yakima River at Union Gap for the irrigation of 107,600 acres and Tieton division from the Tieton River, about 15 miles above its mouth, for 32,000 acres. The project plan provides for the ultimate irrigation of 70,287 acres in the Kittitas division with diversion from the Yakima River at Easton, 58,350 acres in the Roza division diverting from the Yakima River about 10 miles above Yakima, 35,000 acres in the Kennewick division diverting from the Yakima River at Prosser, and 36,750 acres in the Moxee division with diversion from the Tieton River about 5 miles above its mouth. The Wapato Indian project, now being constructed by the United States Indian Service, diverts water from the west side of the Yakima River at Union Gap, for the irrigation of 120,000 acres on the Yakima Indian Reservation.

The irrigation season on the Sunnyside division extends from April 1 to October 31 (214 days) and on the Tieton from April 20 to September 30 (164 days). The water duty on the Sunnyside division is 3 acre-feet per acre, and on the Tieton division 2.4 acre-feet per acre. The soil is volcanic ash, sandy loam, and decomposed basalt. The principal products are alfalfa, apples, pears, peaches, grains, potatoes, sugar beets, hops, stock, and dairy products.

Transportation is furnished by the Northern Pacific, Union Pacific, and Chicago, Milwaukee & St. Paul Railways.

## SUMMARY OF DATA FOR YAKIMA PROJECT TO END OF FISCAL YEAR 1922.

### Areas and crops:

Irrigable acreage when project is completed.....	339,967
Public land entered to June 30, 1922.....	7,358
Public land withdrawn on June 30, 1922.....	13,688
State land unsold on June 30, 1922.....	5,939
Indian land, June 30, 1922.....	241
Railroad land unsold on June 30, 1922.....	21,729
Other private land, June 30, 1921.....	291,032
Acreage service could supply, season of 1921.....	133,509
Acreage irrigated, season of 1921.....	123,000
Acreage cropped under irrigation, season of 1921.....	107,880
Value of irrigated crops, season of 1921.....	\$10,963,410.00
Value of irrigated crops per acre cropped.....	\$101.63

### Finances:

Appropriations—	
Fiscal year 1922, all congressional authorizations.....	\$2,196,463.04
Encumbrances, disbursements, and liabilities.....	1,125,630.21
Unencumbered balance July 1, 1922.....	\$1,072,822.53
Fiscal year 1923; amount specified in appropriation act.....	1,500,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$649,249.00	\$11,006,460.84
<b>Less—</b>		
Funds advanced for construction.....	15,750.00	63,236.50
Water-right contracts—		
Project lands (130,939 acres).....	38,135.89	7,129,796.19
Warren Act lands (approximately 107,912 acres).....	4,550.00	2,408,932.00
Total.....	58,435.89	9,566,964.69
Balance.....	590,813.11	1,408,494.15

\* Contra.

## Summary of data for Yakima project to end of fiscal year 1922—Continued.

	Calendar year 1921.	To Dec. 31, 1921.	Fiscal year 1922.	To June 30, 1922.
Net operation and maintenance cost.....	\$223, 765. 88	\$1, 873, 320. 40	\$209, 351. 36	\$1, 969, 215. 23
Less—				
Charges billed or contracted.....	299, 299. 44	1, 878, 671. 20	277, 699. 88	1, 938, 847. 89
Penalties and discounts (net).....	*1, 100. 80	4, 467. 27	2, 618. 44	4, 496. 92
Total.....	298, 168. 64	1, 883, 138. 47	280, 318. 32	1, 943, 344. 81
Balance.....	*74, 402. 76	*9, 818. 07	*70, 966. 96	45, 870. 42

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensa- tion.	Totals.
Investment to date:				
Disbursements and net transfers.....	\$13, 966, 859. 66	\$71, 999. 46	\$220, 200. 15	\$14, 259, 059. 27
Less collections.....	5, 361, 542. 74			5, 361, 542. 74
Net investment.....	8, 605, 316. 92	71, 999. 46	220, 200. 15	8, 897, 516. 53

\* Contra.

## Status of current accounts receivable as of June 30, 1922.

	Due.		Collected.			Uncol- lected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost: Funds advanced and un- applied cooperative credits.....	\$15, 759. 00	\$63, 236. 50	\$15, 759. 00	\$63, 236. 50		
Water-right charges.....	359, 876. 44	2, 902, 301. 85	323, 969. 04	2, 739, 811. 29	\$26, 446. 87	\$136, 043. 69
Total.....	366, 626. 44	2, 965, 538. 35	339, 719. 04	2, 803, 047. 79	26, 446. 87	136, 043. 69
Construction water-right charges paid in advance.....				3, 589. 60		
To return net operation and maintenance cost: Operation and mainte- nance charges:						
Project lands (130,939 acres).....	259, 272. 30	1, 855, 716. 89	240, 555. 37	1, 721, 753. 80	25, 660. 27	108, 302. 82
Warren Act lands (ap- proximately 107,912 acres).....	18, 604. 46	83, 131. 60	12, 489. 49	77, 000. 00		6, 131. 00
Penalties and interest.....	7, 527. 01	29, 111. 85	7, 527. 01	29, 111. 85		
Total.....	285, 403. 77	1, 967, 969. 74	260, 571. 87	1, 827, 865. 65	25, 660. 27	114, 433. 82
Operation and maintenance charges paid in advance.....				143. 39		
Revenues:						
Rentals of irrigating water.....	5, 118. 89	136, 437. 67	5, 877. 31	135, 696. 75		740. 92
Rentals of power and light.....		3, 635. 33		3, 635. 33		
Rentals of grazing and farming lands.....	504. 07	19, 528. 31	1, 163. 95	19, 305. 01		233. 30
Total.....	5, 622. 96	156, 611. 31	7, 041. 26	158, 637. 09		974. 22
Miscellaneous uncollected.....						1, 019. 77
Other miscellaneous collections.....			48, 653. 04	568, 259. 22		
Grand total collections.....			665, 985. 21	5, 361, 542. 74		



## ACTIVITIES DURING FISCAL YEAR.

## STORAGE.

Construction on Tieton Dam consisted of excavation of outlets and diversion tunnel, and extension of the tunnel intake; excavation for the underground portion of the core wall; placing of core-wall concrete; stripping of dam site; excavation for spillway, and placing of dam embankment. Gravel, concrete cableway, power, and hydraulic sluicing plants were erected and placed in operation. Rock-fill embankment consisted of rock from tunnel and spillway excavation. Earth-fill embankment consisted of borrow pit material dumped from trestles located on the outer slopes of the dam and sluiced toward the core wall by hydraulic giants, thus grading the materials.

## SUNNYSIDE DIVISION.

The operating season of 1921 extended from March 21 to October 31. Maintenance work consisted of removal of silt, moss, and weeds and miscellaneous repairs to canals and structures. Special items were the completion of the Mabton 6.40 sump and chute, repairs to Zillah wasteway, and cleaning of willows from Sulphur Creek wasteway. There were constructed 157 wooden and 96 concrete structures, 2 miles of laterals, three-fourths mile of wood flume, 1½ miles of pipe line, and approximately 2 miles of gravel and rock riprap on the Main Canal.

*Operation data, Sunnyside division, Yakima project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which the service was prepared to supply water.....	93,226	97,285	98,637	100,130	100,733	101,509
Acreage irrigated.....	73,000	80,500	84,650	90,000	93,610	94,500
Number of farms irrigated.....	2,682	2,720	2,780	2,810	2,905	3,065
Miles of canal operated.....	585	590	590	605	605	605
Water diverted (acre-feet).....	349,262	385,179	415,097	421,364	417,522	440,348
Water diverted to land (acre-feet).....	239,896	254,280	290,402	295,215	284,800	309,709
Per acre of land irrigated (acre-feet).....	3.286	3.159	3.430	3.270	3.040	3.28

*Settlement data, Sunnyside division, Yakima project.*

Items.	1917	1918	1919	1920	1921
Total number of farms on project.....	2,740	2,780	2,810	2,905	3,065
Population.....	8,255	8,744	9,477	10,929	12,080
Number of irrigated farms.....	2,740	2,780	2,810	2,905	3,065
Operated by owners or managers.....	1,942	1,983	2,009	2,272	2,322
Operated by tenants.....	798	797	801	633	743
Population.....	8,255	8,744	9,477	10,929	12,080
Number of towns.....	13	13	13	11	11
Population.....	5,550	5,975	7,650	6,941	6,941
Total population of towns and on farms.....	13,806	14,719	17,127	17,870	19,021
Number of public schools.....	37	37	37	40	41
Number of churches.....	30	30	30	30	30
Number of banks.....	9	10	13	13	13
Total capital stock.....	\$277,500	\$275,000	\$400,000	\$380,000	\$397,000
Total amount of deposits.....	\$2,349,702	\$2,642,851	\$4,388,610	\$2,695,848	\$2,914,608
Total number of depositors.....	7,375	7,936	11,182	11,566	11,643

## TIETON DIVISION.

In 1921 diversion of water from the Tieton River continued from July 1 to October 15, the first reduction below maximum carrying capacity of the Main Canal occurring on September 11. The irrigation season of 1922 began on April 23, about 10 days later than usual, owing to the late spring.

Maintenance work consisted of cleaning weeds and silt from 335 miles of canals and laterals comprising the entire distribution system down to each farm unit, as well as the repair and replacement of structures; 75 cubic yards of concrete were placed in division and measuring box structures, 2,000 linear feet of wood-stave flume were erected, and 4 miles of pipe lines, eliminating open ditches and small wooden flumes, were installed.

*Operation data, Tieton division, Yakima project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	30,000	31,000	31,000	32,000	32,000	32,000
Acreage irrigated.....	23,000	25,400	26,400	27,000	28,000	28,500
Miles of canal operated.....	335	335	335	335	335	335
Water diverted (acre-feet).....	74,936	80,377	90,280	98,223	96,506	100,844
Water served to land (acre-feet).....	49,412	57,318	64,068	70,776	69,471	71,148
Per acre of land irrigated (acre-feet).....	2.15	2.26	2.43	2.62	2.47	2.50

*Settlement data, Tieton division, Yakima project.*

	1917	1918	1919	1920	1921
Total number of farms on project.....	1,400	1,400	1,480	1,480	1,480
Population.....	2,150	2,150	2,850	3,314	3,457
Number of irrigated farms.....	1,190	1,280	1,253	1,340	1,300
Operated by owners or managers.....	726	820	903	1,048	1,010
Operated by tenants.....	464	460	350	292	280
Population.....	2,150	2,150	2,850	3,314	3,457
Number of towns.....	7	8	8	8	8
Population.....	20,500	21,850	23,000	23,000	23,000
Total population of towns and on farms.....	22,650	24,000	25,850	26,314	26,457
Number of public schools.....	10	10	10	10	10
Number of churches.....	3	3	3	3	4

## WYOMING, RIVERTON PROJECT.

H. D. Comstock, project manager, Riverton, Wyo.

The Riverton project lies in Fremont County, Wyo., northeast of Wind River and west of the Big Horn River. Adjacent towns on the Chicago & North Western Railway are Riverton and Shoshoni with estimated populations of 2,000 and 500. The source of water supply is Wind River. The irrigation season is from May 1 to September 30. The average altitude is 5,200 feet; the average annual rainfall is about 8 inches; the average maximum temperature is about 95° F.; and the average minimum temperature -27° F. The soil is a heavy loam. The principal products are alfalfa, cereals, sugar beets, potatoes; and the principal markets, Omaha, Denver, and local. The estimated duty of water is 2 acre-feet per acre per annum at the farm.

The flood waters of Wind River, Bull Lake Creek, and Dinwoody Creek will be stored in Pilot Butte, Bull Lake, and Dinwoody Reservoirs. The waters of Wind River will be diverted into the Wyoming Canal serving the entire project.

### SUMMARY OF DATA FOR RIVERTON PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas:</b>		
Irrigable acreage when project is complete.....	100,000	
Public land withdrawn on June 30, 1922.....	69,000	
Indian land, June 30, 1922.....	1,000	
Private land, June 30, 1922.....	30,000	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$356,994.49	
Encumbrances, disbursements, and liabilities.....	396,672.05	
Unencumbered balance July 1, 1922.....		\$460,322.44
Fiscal year 1923, amount specified in appropriation act.....		925,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$308,934.69	\$634,407.64
Balance.....	308,934.69	634,407.64

	Reclamation Fund.	Indian Funds.	Increase of compensation.	Total.
<b>Investment to date:</b>				
Disbursements and net transfers.....	\$466,879.89	\$359,192.00	\$29,119.55	\$855,191.44
Less collections.....	19,043.72	985.46		20,029.18
Net investment.....	447,836.17	358,206.54	29,119.55	835,162.26

#### *Status of current accounts receivable as of June 30, 1922.*

Miscellaneous uncollected.....	\$523.13
Miscellaneous collections, fiscal year 1922.....	2,070.05
Total to June 30, 1922.....	20,029.18

### ACTIVITIES DURING FISCAL YEAR.

On the Wyoming Canal one drag-line excavator was employed throughout the year working two shifts, and a second about half the year, also working two shifts. Approximately 600,000 cubic yards were excavated during the fiscal year.

Work on the Wind River diversion dam at the head of the Wyoming Canal was begun in July, 1921, and continued throughout the fiscal year, except as delayed by cold weather. Approximately 14,000

cubic yards were excavated for this structure and 3,560 cubic yards of concrete were placed. The earth dike at the south end of the dam was begun in the spring of 1922 and approximately 50,000 cubic yards of embankment were placed.

*Settlement data, Riverton project.*

Items.	1919.	1920	1921
Number of towns.....	2	2	2
Population.....	2,500	2,500	1 2,500
Number of public schools.....	2	2	2
Number of churches.....	7	7	7
Number of banks.....	5	5	5
Total capital stock.....	\$110,000	\$125,000	\$135,000
Amount of deposits.....	\$1,200,000	\$1,500,000	1 900,000
Number of depositors.....	2,700	2,600	1 2,200

<sup>1</sup> Estimated.

## WYOMING, SHOSHONE PROJECT.

J. S. LONGWELL, project manager, Powell, Wyo.

The Shoshone project is located in Park and Big Horn Counties, Wyo., and Carbon County, Mont. The principal project towns are Powell and Deaver. Transportation facilities are provided by the Chicago, Burlington & Quincy Railroad. The water supply is obtained from the Shoshone River; rainfall averages 5.4 inches; the average elevation is 4,500 feet above sea level; temperature records show a mean maximum of 98.3° F. and a mean minimum of -19.4° F. Agricultural products consist principally of alfalfa, wheat, oats, potatoes, and sugar beets. The average duty of water is 2.29 acre-feet per acre irrigated.

Storage is provided in Shoshone Reservoir, created by the Shoshone Dam, to supplement direct flow rights from the river. The irrigation plan contemplates three diversions from the river. The highest diversion, that for the proposed Heart Mountain division, will be about 100 feet above stream bed at the Shoshone Dam. The second diversion, in operation since 1908, at Corbett Dam 8 miles below Cody, is one of 1,000 second-feet for the irrigation of lands in the Garland and Frannie divisions. The third diversion, not yet constructed, will be 16 miles below Cody, for the Willwood division.

### SUMMARY OF DATA FOR SHOSHONE PROJECT TO END OF FISCAL YEAR 1922.

#### Areas and crops:

Irrigable acreage when project is complete.....	1 139, 000
Public land entered to June 30, 1922.....	64, 630
Public land open to entry on June 30, 1922.....	1, 895
Public land withdrawn on June 30, 1922.....	59, 870
State land unsold on June 30, 1922.....	5, 896
Railroad land unsold on June 30, 1922.....	987
Other private land, June 30, 1922.....	6, 723
Acreage service could supply, season of 1921.....	65, 826
Acreage irrigated, season of 1921.....	45, 420
Acreage cropped under irrigation, season of 1921.....	43, 880
Value of irrigated crops, season of 1921.....	\$712, 540
Value of irrigated crops per acre cropped.....	\$16. 24

#### Finances:

Appropriations—	
Fiscal year 1922, all congressional authorizations.....	\$1, 812, 549. 40
Encumbrances, disbursements, and liabilities.....	892, 394. 18
Unencumbered balance July 1, 1922.....	\$920, 155. 22
Fiscal year 1923, amount specified in appropriation act.....	975, 000. 00

		Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>			
Net construction cost.....		\$763, 603. 68	\$7, 479, 857. 32
Less—			
Funds advanced and unapplied cooperative credits.....		1, 000. 00	1, 000. 00
Water-right contracts, project lands (86,441.58 acres).....		312, 630. 24	4, 899, 204. 06
Total.....		313, 630. 24	4, 900, 204. 06
Balance.....		450, 063. 44	2, 579, 653. 26
<hr/>			
	Calendar year 1921.	To Dec. 31, 1921.	
Net operation and maintenance cost.....	\$81, 869. 29	\$527, 926. 30	59, 408. 07
Less:			
Charges billed or contracted.....	121, 066. 46	535, 962. 95	121, 137. 95
Penalties and discounts (net).....	* 578. 13	* 2, 988. 14	* 78. 70
Total.....	120, 488. 33	532, 974. 81	121, 059. 25
Balance.....	* 38, 619. 04	* 5, 048. 51	* 61, 651. 18
			25, 054. 07

<sup>1</sup> Does not include 90,000 acres in the Oregon Basin and 30,000 acres in Chapman Bench and Sand Coulee division for which lands have been withdrawn, but the construction of which have not yet been approved. See irrigable land table in appendix.

*Summary of data for Shoshone project to end of fiscal year 1922—Continued.*

	Reclamation fund.	Judgments Court of Claims.	Increase of compensation.	Total.
Investment to date:				
Disbursements and net transfers.....	\$8, 171, 298. 68	\$322, 164. 67	\$129, 444. 58	\$8, 622, 907. 93
Less collections.....	1, 191, 754. 26			1, 191, 754. 26
Net investment.....	6, 979, 544. 42	322, 164. 67	129, 444. 58	7, 431, 153. 67

\* Contra.

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year, 1922.	To June 30, 1922.		
To return net construction cost: Funds advanced and unapplied cooperative credits.. Water-right charges.....	\$1,000.00 98,355.83	\$1,000.00 684,845.14	\$1,000.00 39,582.12	\$1,000.00 582,324.65	.....	\$102,520.49
Total.....	99,355.83	685,845.14	40,582.12	583,324.65	.....	102,520.49
Construction water-right charges paid in advance.....				392.13	.....	
To return net operation and maintenance cost: Operation and maintenance charges, project lands (64,441.58 acres)..... Penalties and interest.....	121,137.95 1,318.41	535,822.00 5,844.43	44,705.26 1,318.41	381,146.97 5,844.43	\$9,356.06	145,318.97
Total.....	122,456.36	541,666.43	46,023.67	386,991.40	9,356.06	145,318.97
Operation and maintenance charges paid in advance.....				197.01		
Revenues: Rentals of irrigating water.. Rentals of power and light.. Rentals of grazing and farming lands.....	1,672.36 812.70 70.75	11,518.77 812.70 7,270.32	1,604.80 494.10 65.94	11,050.59 494.10 6,965.07	.....	468.18 318.60 305.25
Total.....	2,555.81	19,601.79	2,164.84	18,509.76	.....	1,092.03
Miscellaneous uncollected.....						1,717.25
Other miscellaneous collections.....			10,056.10	202,849.31		
Grand total collections...			98,826.73	1,191,754.26		

**ACTIVITIES DURING FISCAL YEAR.**

*Power plant.*—Work on the Shoshone power plant, located at the Shoshone Dam, was practically completed during the year, the principal remaining item being the installation of the 36-inch balanced needle valve at the end of the by-pass pipe. Two 1,000 kilovolt amperes units were installed. The transmission line designed to operate at 33,000 volts was constructed, extending through the Heart Mountain, Garland, and Frannie divisions, and will furnish power for construction and drainage work and for domestic and municipal purposes. The power plant and transmission line were placed in operation April 21, 1922.

*Frannie division.*—Structures for the 5,000 acres opened to settlement in September, 1921, were completed. Work was done on

drainage by three drag lines during the 1921 season and by two drag lines during the 1922 season until the fore part of June. Work was then undertaken under a supplemental construction program for which the water users had voted a charge of \$30 per acre. Equipment on hand was being electrified and additional electrical equipment transferred to the work so that an extensive program can be carried out. During the year 5.85 miles of open drain were constructed, continuing work on the Mantua Flat and the area west of Deaver and beginning new work northwest of Deaver and on the deepening of the reach of Sage Creek passing through the division. A deep drain for unwatering two closed contours near Mile Post 5 of the Cody Branch of the Chicago, Burlington & Quincy Railroad was constructed. These contours and irrigable area tributary thereto embrace an area of 950 acres of vacant public lands under constructed ditches but not yet opened to entry because of lack of drainage. This drain will also furnish subsurface drainage outlet for that area.

*Garland division.*—Drainage work was carried on principally with four drag lines during the 1921 season and with two draglines during the 1922 operating season. The Austin trencher constructed 0.34 mile of closed drain; 17.21 miles of open drain were constructed in the North Garland and Dry Lake areas and in the area northwest of Garland.

*Operation data, Shoshone project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service is prepared to furnish water.....	42,623	43,265	55,296	56,119	65,890	65,826
Acreage irrigated.....	29,977	32,984	38,262	41,641	45,650	45,420
Miles of canal operated.....	266	286	381	415	458	460
Water diverted (acre-feet).....	125,632	128,629	162,463	199,061	187,329	221,419
Water delivered to land (acre-feet).....	70,247	68,730	84,378	117,459	113,065	112,324
Per acre of land irrigated (acre-feet).....	2.34	2.10	2.29	2.81	2.50	2.47

*Settlement data, Shoshone project.*

Item.	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	650	646	830	823	1,009	1,005
Population.....	1,825	1,941	2,320	2,481	2,730	2,686
Number of irrigated farms.....	593	621	750	803	910	935
Operated by owners or managers.....	430	467	616	619	665	646
Operated by tenants.....	160	154	134	184	215	289
Population.....	1,825	1,941	2,320	2,481	2,730	2,686
Number of towns.....	3	4	5	5	5	5
Population.....	630	1,082	1,170	1,395	1,345	1,541
Total population on farms and in towns.....	2,455	3,023	3,490	3,876	4,075	4,227
Number of public schools.....	6	8	10	11	12	7
Number of churches.....	7	7	8	8	8	8
Number of banks.....	3	3	5	5	6	5
Total capital stock.....	\$80,000	\$80,000	\$75,000	\$110,000	\$125,000	\$110,000
Amount of deposits.....	\$300,000	\$488,000	\$654,000	\$955,000	\$844,000	\$543,000
Number of depositors.....	1,290	1,500	1,875	2,500	2,606	2,400

## SECONDARY PROJECTS.

### COOPERATIVE INVESTIGATIONS AND PROPOSED PROJECT EXTENSIONS.

**NOTE.**—A description of secondary projects and investigations carried on under cooperative contracts can be found in previous annual reports with brief descriptions and complete references on pages 393 to 453 of the Twentieth Annual Report. The following discussions are limited to those projects on which work was done during the fiscal year ending June 30, 1922.

#### ARIZONA.

##### BOULDER CANYON RESERVOIR INVESTIGATIONS

Investigations were carried on under cooperative contracts with the Coachella Valley County water district, Imperial irrigation district, city of Los Angeles, and city of Pasadena. Studies of water supply, irrigation storage, flood detention, silt storage, and power development were continued, including preliminary designs and cost estimates of reservoirs of various capacities in combination with varying amounts of power development and of reservoirs to serve as flood-detention basins only. Drilling operations at Boulder Canyon were limited to the upper (C) dam site. Forty-nine holes were drilled, making a total of 79, of which 67 are located at the upper dam site and 12 at the lower (A) site. The rock was in all cases found to be a fine-grained granite of excellent quality, although jointed to a considerable extent. The conclusion reached from the previous season's work, that bed rock would be found at depths not exceeding 140 feet below low-water surface, was not changed by this year's work. There are two dam sites in Black Canyon, the entrance to which is about  $18\frac{1}{2}$  miles by river below the entrance to Boulder Canyon. Field investigations were limited to the upper site, located one-fourth mile below the canyon entrance. A drill camp was opened early in January. It was necessary to build three-fourths mile of road and  $1\frac{1}{2}$  miles of trail in order to reach the point selected for drilling. A drill barge and small boats were built, equipment assembled, and drilling started on February 22. A line of holes was drilled across the river to develop the cross section of the river channel. In general the river trench is filled with gravel and boulders, overlaid with about 20 feet of sand. Eight holes were drilled in the river and in the deepest one bedrock was reached at a depth of 62 feet below low-water surface. However, the investigations have not been carried far enough for it to be said that this is the maximum depth to bedrock at the upper dam site. The deepest hole drilled in the river penetrated bedrock 53 feet. In order to ascertain the character and quality of the rock at greater depths than reached by the river holes, a land hole was drilled on the Nevada side of the river to a depth of 259 feet, 193 feet below low-water surface. In all cases the rock was found to be a lava, termed quartz latite, in the form of a flow breccia, by Dr. F. L. Ransome, of the United States Geological Survey.



## CALIFORNIA.

## IMPERIAL VALLEY PROJECT.

(See also Arizona, Boulder Canyon investigation.)

A complete report on investigations carried on pursuant to the act of Congress approved May 18, 1920 (41 Stat. 600) was issued by the director under date of February 4, 1922, and subsequently published as Senate Document No. 142, and later by the Committee on Irrigation of Arid Lands of the House of Representatives. An open hearing was held by the Secretary of the Interior at San Diego, Calif., on December 12, 1921, at which the problems of the Imperial Valley were publicly discussed by the interested parties. The Colorado River Commission held numerous hearings, but final conclusions had not been announced at the end of the fiscal year.

## OWENS VALLEY PROJECT.

Detail investigations under contract with the city of Los Angeles were completed and final report was approved by the director on November 14, 1921. The conclusions reached were to the effect that a project of 50,000 acres is feasible in the Owens Valley at an expenditure of \$2,000,000 towards the cost of necessary diversion works for the water supply from Mono Basin.

## SHASTA VALLEY PROJECT.

In 1921 the Klamath-Shasta Valley irrigation district was formed, embracing about 190,000 acres in the Shasta Valley, Calif. A cooperative agreement was made between the United States Reclamation Service, the State of California, and the district, providing for an investigation and surveys to determine the feasibility and probable cost of a project, including storage and diversion of the waters of the Klamath River and its tributaries for irrigation of lands within the district and for power development. Under this agreement the Reclamation Service, the State, and the district furnish funds to cover the cost of the investigations. Canal surveys were begun in April, 1922.

## STONY GORGE EXTENSION OF THE ORLAND PROJECT.

*Stony Gorge.*—Following the drought season of 1920, which demonstrated that development of storage at Stony Gorge was not feasible owing to insufficient run-off during seasons of extreme drought, further consideration of storage at this point was abandoned and attention directed toward Millsite, 9 miles below Stony Gorge and 20 miles west of Orland.

*Millsite.*—Investigations regarding development of 115,000 acre-feet of storage at Millsite as a means of insuring the Orland project against a serious water shortage in drought seasons were undertaken at the request of the directors of the Orland Unit Water Users' Association, who have agreed to repay the cost of the investigation, not exceeding \$10,000, by increased operation and maintenance charges if no construction is undertaken. A detailed topographic survey of the dam site and an extension of the reservoir topography were made and diamond drilling at the dam site was in progress at the close of the fiscal year.

**COLORADO.****ORCHARD MESA PROJECT.**

This project embraces 10,000 acres of land on the south side of the Colorado River, between Palisade and Grand Junction, Colo., and included within the Orchard Mesa irrigation district. Arrangements have been completed for the inclusion of this district as a division of the Grand Valley project. On February 18, 1922, a contract was entered into between the United States, the Grand Valley Water Users' Association, and the Orchard Mesa irrigation district providing for the expenditure of not to exceed \$1,000,000 for the reconstruction of the irrigation system, construction of a drainage system, and settlement of outstanding indebtedness.

**IDAHO.****BOISE PROJECT EXTENSION: BLACK CANYON DIVISION.**

The Black Canyon division comprises an area of 56,000 acres, exclusive of the Notus division (supplied by the Notus Canal), which has been completed. This extension is located between the Boise and the Payette Rivers in Canyon and Gem Counties, Idaho. A plan was developed under which the United States would build the Black Canyon diversion dam in the Payette River, which would supply the Emmett irrigation district and eliminate a long stretch of hazardous canal. The dam would also divert water as well as furnish power for the Black Canyon division. A contract providing for the construction of the diversion dam was executed by the United States and the Emmett irrigation district under date of November 8, 1921. The contract provides that the district will pay the full cost of the dam, with a further provision that if the dam is used for diverting water to the Black Canyon division it will bear one-half of the cost. Purchase of right of way for the dam has been made. Some detail surveys, as well as a limited amount of testing for bedrock, were done during the year.

**DUBOIS PROJECT.**

In June, 1922, surveys were started to determine the feasibility of diverting from the South Fork of Snake River, thus making available additional water resources and storage possibilities. As the surface waters of this locality drain into Mud Lake and Lost River sinks, which have no surface outlet, the study of the underground movement of water in this vicinity being made by the United States Geological Survey in cooperation with the State of Idaho will have an important bearing upon the feasibility of this project. These investigations will be made under a cooperative agreement by which one-half of the cost will be advanced by those interested and one-half by the Reclamation Service.

**PORTNEUF PROJECT.**

This project is located in the southeastern part of Idaho and was covered by a preliminary survey in 1908. It includes about 25,000 acres of land in the vicinity of Chesterfield and Bancroft and about 40,000 acres between Pocatello and American Falls. On account of

its dependence upon the irrigation works of the Fort Hall Indian project, it has, in recent years, been included in the Greater Fort Hall project. This project contemplates the utilization of the Blackfoot Reservoir of the Indian Service on highlands in the Blackfoot and Portneuf River watersheds and replacing the storage so used with equivalent amounts from the Jackson Lake Reservoir, the Jackson Lake storage rights being obtained by acquiring rights in the proposed American Falls Reservoir and effecting an exchange with the present owners of storage rights in the Jackson Lake Reservoir.

#### MOUNTAIN HOME PROJECT:

This project is located in Ada and Elmore Counties, in southwestern Idaho, and contains a gross area of 700,000 acres, of which 420,000 acres are classed as irrigable. Although a partial water supply has been considered from the Boise, Salmon, and Payette Rivers, the entire area could be irrigated from the Snake River, if fully regulated by reservoirs at American Falls and other sites. A canal would divert on the north side of the Snake River at Milner Dam; the length of the canal would be 112 miles to the head of the irrigable area, which has an unusually smooth and even surface, over which the water could readily be distributed. If the present plan of supplying storage water to supplement old rights in the upper Snake River Valley is fully carried out, it is estimated that there will be only sufficient water supply in Snake River economically to irrigate about 400,000 acres of new land, and the proposed extension of the Minidoka project will take over 100,000 acres of this, so that it is possible to reclaim only about 300,000 acres of the proposed Mountain Home project, or some other equal area. A preliminary line from Milner Dam and Mountain Home was run in 1918 which has been supplemented during the past year by detailed topography taken over about 20 miles of the most difficult country to be traversed by the main canal. The most recent surveys are being conducted under contract with the Boise Chamber of Commerce.

#### HANSEN BUTTE PUMPING PROJECT.

This project is situated in Twin Falls County in south central Idaho, on the south side of Snake River above the Twin Falls Canal, and extends from Milner nearly to Rock Creek 15 miles west. The irrigable land is mostly in private holdings. It can be covered by pumping from the Twin Falls Canal or from Snake River above Milner Dam. The area that could be covered depends upon the height to which water is lifted; up to 40,000 acres can be served by a pumping lift of 150 feet. The project has been under consideration for a number of years. Recently a private company has installed a small pumping plant with a lift of 65 feet and a canal covering about 7,000 acres. The Murtaugh irrigation district has been organized recently to install another pumping plant with a lift of 150 feet to cover between 30,000 and 35,000 acres. Bonds to the amount of \$3,700,000 were voted in the spring of 1922. The source of water supply is Snake River, and storage will have to be provided either at American Falls or some other reservoir site. The district plans to secure power for pumping by combining the power available at the mouth of Rock Creek and at Auger Falls power site on Snake River.

## MINIDOKA PROJECT EXTENSION: NORTH SIDE PUMPING DIVISION.

This division lies to the north and west of the divisions of the Minidoka project which are at present in operation in Minidoka and Jerome Counties in southern Idaho. It contemplates the development of 115,000 acres of irrigable land, practically all of it being public land withdrawn from entry. The source of water supply is Snake River, and storage will be required at American Falls or some other site. A hydroelectric power plant will be necessary to generate power for the operation of pumping plants. Water will be pumped from Snake River above the present Minidoka Dam. The maximum lift required is 120 feet. Preliminary surveys were made in 1908, 1912, and 1913. More detail surveys were begun in 1918 and the field work on these has been completed.

## LAKE WALCOTT PUMPING DIVISION.

This proposed division lies along the south shore of Lake Walcott, in Cassia County, Idaho, the west edge being about a mile east of Minidoka Dam. The plan calls for the pumping of water from Lake Walcott with a maximum lift of 30 feet above the lake for the irrigation of about 2,000 acres. The water supply is from Snake River supplemented by storage to be obtained at Jackson Lake, American Falls, or some other reservoir site on Snake River. Power required for pumping can be developed at Minidoka Dam or at American Falls. The land is practically all public land withdrawn from entry.

## AMERICAN FALLS RESERVOIR.

The American Falls reservoir site is located in southeastern Idaho in the vicinity of American Falls, Pocatello, Blackfoot, and Aberdeen. The dam would be located at American Falls immediately above the point where the Oregon Short Line Railroad crosses Snake River. A 100-foot dam would impound 3,000,000 acre-feet and make available for irrigation the entire resources of Snake River. The estimated capacity to which the reservoir should be built varies from 1,500,000 to 3,000,000 acre-feet, depending upon the location of future development of new lands. The geological conditions of the dam and reservoir site are considered favorable. Water users' organizations, representing about 500,000 acres of land, have signed contracts for storage space in the reservoir. Other contracts are awaiting the completion of the legal steps necessary to permit the interested organizations to sign the contracts and finance their obligations. Investigations including topographical surveys, classification and appraisal of lands in the reservoir site, planning a new townsite for American Falls, and drilling the dam site have been continued. Title has been obtained to practically all of the dam site. Condemnation proceedings have been carried through on several tracts. Funds have been made available for purchasing a part of the land in the reservoir site.

**MONTANA.****CLARK FORK PROJECT.**

This project, located near the Montana-Wyoming boundary line, contemplates the irrigation of lands in Carbon and Stillwater Counties, Mont., and Park County, Wyo. Investigations consisted of a classification of project lands, preliminary survey of various canal lines, examination of storage sites, water supply studies, and estimates of cost. Two schemes of development were considered: (1) The irrigation of all lands by diversion from the Clark Fork River with a long gravity supply canal extending the length of the valley and supplying water to some 60,800 acres, and (2) the irrigation by direct diversion from the Clark Fork River of the upper lands of the project as far as Grove Creek and the irrigation of the remaining lower lands by water diverted from Rock Creek, near Red Lodge, Mont., replacing the flow of Rock Creek, which is fully appropriated, by water obtained from a proposed storage reservoir on East Rosebud River. The investigations show that in either case storage will be required on the Clark Fork River to augment the supply for the project land to be irrigated from that stream. A storage reservoir having a capacity of 100,000 acre-feet, with a depth of water of 140 feet at the dam site, was investigated on Sunlight Creek, a tributary of the Clark Fork. The conclusions were that the cost per acre would be very high for either plan, and that the quality of the land within the proposed project would not justify the expense necessary to construct the system.

**CUT BANK PROJECT.**

This project involves the irrigation, by diversion from Cut Bank Creek, of approximately 14,400 acres in the vicinity of Cut Bank, Mont., all in private ownership, together with 9,000 acres included within the boundaries of the Blackfeet Indian Reservation. A contract was entered into with the Cut Bank irrigation district June 13, 1921, for financing an investigation to determine the feasibility and probable cost of irrigating the land outside of the Indian Reservation. During the fall of 1921 the project manager at Browning made preliminary surveys of the irrigable area and several possible reservoir sites, a study of the water supply, and an estimate of cost of a distributing system and storage works. It was concluded that sufficient water is available for a complete supply for reservation lands and a good supply for the lands under consideration not taking into account any other rights; that storage works will be necessary, and that a canal and lateral system can be constructed without engineering difficulties or heavy construction at a reasonable cost, but that necessary storage works will be expensive. The report of the investigations was approved by the director April 24, 1922.

**KALISPELL. (HELENA FLATS) PROJECT.**

This proposed project is located in northwestern Montana in Flathead County, and lies directly north of Kalispell. There is an area of about 14,000 acres of irrigable land which may be watered from Flathead River without need of storage, or Whitefish River with storage in Whitefish Lake. In addition to these sources of

supply there is an underground flow from which the southern part of the tract could be irrigated by pumping from wells with a lift of about 10 feet which would be feasible for irrigation use whenever electric power, which is now available in the vicinity of Kalispell, is distributed to the individual farms. As these farms are generally partly in brush and timber not yet cleared, this development is probably the most feasible for such lands. The investigations made were not sufficient to warrant definite conclusions, but further studies are believed advisable.

#### LITTLE BITTERROOT (CAMAS) PROJECT.

This project is located along the Little Bitterroot River below the Camas division of the Flathead project and east of Camas, Mont. The lands were formerly a part of the Flathead project and were released at the request of the unitholders who believed that the artesian well supply would be sufficient for irrigation of their lands. Investigations were made in 1921 by engineers of the Flathead project under contract with the Farmers' Development Association of Camas, Mont. About 2,000 acres of land lying in a narrow strip along the banks of the river may be irrigated by the construction of a canal 18 miles long excluding laterals. The water supply is dependent on storage of the winter and spring run-off of Little Bitterroot River and Sullivan Creek below the storage reservoirs of the Flathead project to supplement the flow of private artesian wells. A site for a storage reservoir was found on the river immediately above the proposed diversion for the canal which will provide sufficient storage for the project. The estimated cost of construction of the project is reasonable, and the lands are of good quality adapted to raising of alfalfa and other hay crops, grains, small fruits, etc. All of the lands are in private ownership and a large percentage now under cultivation.

#### TALLY LAKE PROJECT.

These investigations, which were carried on under contract with the Tally Lake irrigation district, dated November 28, 1919, were completed and final report was approved by the director on September 26, 1921.

#### NEBRASKA.

##### LOWER PLATTE PROJECT.

The Lower Platte project is located in the south-central part of Nebraska, in Lincoln, Dawson, and Buffalo Counties, on both sides of the Platte River from which it is contemplated to derive the water supply. The proposed irrigable lands extend along the South Platte and Platte Rivers, from Sutherland to Lexington on the south side, a distance of 84 miles; from North Platte to Shelton, on the north side, a distance of 118 miles. The net irrigable acreage under the proposed canals of this project in its ultimate development embraces 310,000 acres, exclusive of the 135,000 acres gross under the present operated canals. On August 24, 1921, a contract was drawn up and signed between the Lower Platte Irrigation Association and the United States Reclamation Service whereby it was agreed to make

an engineering investigation to determine the cost and feasibility of this project, the cost of the work to be limited to \$30,000, two-thirds to be borne by the association and one-third by the Reclamation Service. Field work on the canal location and reservoirs was commenced on October 20, 1921, and completed on May 1, 1922. As the successful irrigation of these lands depends on storage water to be available during the months of July and August, when the flow in the Platte River is inadequate to supply even the existing rights, a system of inland reservoirs was surveyed to impound the flood waters of this river. Drainage investigations were made over the low-lying lands, between Maxwell and Kearney, on the north side of the Platte River, where there are approximately 60,000 acres requiring drainage at the present time. Nearly all this area is under existing canals in operation at the present time. The project presents a number of alternative schemes of irrigation and development making it necessary to look into them all for comparative costs and for a proper plan of development by successive stages, finally reaching the ultimate completion. In conjunction with the irrigation possibilities, the development of hydroelectric power is being investigated. As the report has not been completed the final recommendations and conclusions can not be given.

## NEVADA.

### UPPER OWYHEE PROJECT.

A cooperative investigation with the State of Nevada was conducted in September, 1921, to determine the feasibility of diverting water from the Owyhee River to the Little Humboldt drainage basin. A rough field inspection indicated probable high costs and lands of only fair quality. These factors, together with a doubtful water supply, led to a decision to defer further work until more extended records of run-off shall be available.

## NEW MEXICO.

### CARLSBAD EXTENSION: PECOS RIVER INVESTIGATIONS.

Contracts were entered into between the United States and the Pecos Water Users' Association, dated September 22, 1920, and May 2, 1921, for financing an investigation to determine the cost and feasibility of impounding flood waters for the irrigation of 20,000 acres of new land in the Pecos Valley near Carlsbad, N. Mex., supplying storage for the Fort Sumner irrigation district; and for additional storage for the present Carlsbad project, which is necessary if shortages are to be avoided due to the silting up and heavy leakage from McMillan Reservoir. In 1921 a field examination was made; data were assembled and a report on water supply was submitted May 28, 1921. In August of the same year a field party completed topographic surveys of the Alamogordo Reservoir and two sites for a dam. Under date of September 2, 1921, the designing engineer submitted a preliminary design and estimate of cost of the Alamogordo Dam. In December, 1921, N. H. Darton, geologist, United States Geological Survey, made field examinations of the No. 3 and the Alamogordo Reservoir sites, and in January, 1921, submitted preliminary reports

on the geology of these sites and recommended that borings be made at the dam sites to determine the underground formations. The cores and samples recovered from the borings were treated chemically at Washington. Under date of May 31, 1922, he submitted a supplemental report on the Alamogordo Reservoir which in part reads as follows: "These results (speaking of the borings) indicate that the underground conditions at the dam site are entirely favorable to sustain the dam and retain the water." His opinions on the underground condition for a dam at the No. 3 site have not yet been submitted. Estimates of cost for an enlarged project are now in course of preparation based on surveys made by the original owners of the Carlsbad project at its inception and revised by the service in 1915. Final conclusions as to the feasibility of the project can not be drawn until the receipt of the geological report on the practicability of dam construction at the No. 3 site.

#### MIDDLE RIO GRANDE PROJECT.

Under date of May 31, 1922, a contract was executed by the Rio Grande Survey Commission of New Mexico, providing funds for the compilation of data secured by the State and from other sources on the drainage situation in the Rio Grande Valley between San Marcial and White Rocks Canyon and facilities for storage and diversion of water for irrigation of these lands after drainage. Maps have been completed of seeped areas showing topography and ground water elevations preliminary to a detail study and report on the situation and estimate of cost of reclamation of these lands by drainage and irrigation.

#### OREGON.

##### BAKER PROJECT.

Under date of October 15, 1921, the Baker Chamber of Commerce of Baker, Oreg., executed a contract providing funds for a review of the engineering data in the hands of the Powder River Land & Irrigation Co., augmented by field surveys, to secure additional data on the feasibility and cost of irrigation of about 30,000 acres of new lands and supplemental supply for about 7,500 acres of land heretofore irrigated but having an insufficient water supply during the latter part of the irrigation season, by storage and diversion of the waters of the lower Powder River. Surveys were made for relocation of about  $2\frac{1}{2}$  miles of the main line of the Oregon-Washington Railroad & Navigation Co. and  $1\frac{1}{2}$  miles of the old Oregon Trail now used as a State highway, both of which interfere with the storage capacity required in the proposed Thief Valley Reservoir. Survey was made of an alternate dam site for the Thief Valley Reservoir about  $2\frac{1}{2}$  miles below the dam site heretofore investigated by the company, and although a dam at this site is about 25 feet higher the site appears to be more favorable and by its location about 3 miles of main canal construction over rough topography is avoided and the storage capacity is increased from 130,000 to 146,000 acre-feet. The company's main canal was located through the canyon on the south side of the river but an alternative line on the opposite side shows a less total length and involves less heavy construction. Report on surveys and estimated cost was issued in April, 1922, which shows the probable



cost per acre to be high; the report was under review at the end of the fiscal year by a board of engineers designated for such purpose. Further work will depend on the final decision as to feasibility of the project. At the close of the fiscal year a geological examination of the No. 2 Dam site by A. C. Spencer of the United States Geological Survey was in progress and plans for drilling the site, if favorable report is received, were under way.

#### DESCHUTES PROJECT.

Following preliminary investigations and surveys in 1921 a board reviewed the proposed project in connection with the use of the waters of the Deschutes River and issued a report dated August, 1921; after review of the conditions in the field by the director, it was decided that owing to local differences it would not be practical to secure a reduction of the large private holdings in the valley and agreement of private interests and further work on the project was indefinitely postponed. A summary of the engineering data secured and final report on the project were compiled for future reference under date of April, 1922.

#### OWYHEE PROJECT.

A contract was entered into with the State of Oregon under date of May 17, 1921, for a complete investigation of this project. Considerable field work was done during the summer of 1921, estimates were prepared, and a report was submitted which was approved by the director under date of February 28, 1922. This project is located in Malheur County, in eastern Oregon, and Owyhee County in southwestern Idaho. The project includes about 132,000 acres on the west and south side of Snake River, north and south of the Owyhee. It extends from the vicinity of Ontario on the north far enough south to include the 30,000 acres in the Gem irrigation district. About 39,000 acres covered by the proposed plan are now covered by pumping. The present plan provides for storage at Duncan Ferry site, located on the Owyhee River about 110 miles from its mouth. A diversion dam is to be located about 15 miles above Mitchell Butte, 250 feet above low water level, with the main canal starting from the level of the diversion dam crest. A number of tunnels will be necessary.

#### UMATILLA PROJECT EXTENSIONS.

Stream measurements for the purpose of securing a more reliable estimate of the available water supply were continued.

#### OREGON-CALIFORNIA.

##### KLAMATH PROJECT: HORSEFLY STORAGE.

The Horsefly Reservoir site is located on Miller Creek, a tributary of Lost River. This reservoir will be used to prevent water flowing into Tule Lake and to provide a stored water supply for about 14,000 acres in Langell Valley. The reservoir will permit the reclamation of additional lands in Tule Lake and will also afford protection against resubmergence. The Langell Valley lands are prac-

tically all in private ownership; those in Tule Lake are in public ownership. During 1921 preliminary designs were prepared for three types of dam. The capacity of the reservoir will be about 90,000 acre-feet.

#### KLAMATH PROJECT: LANGELL VALLEY DIVISION.

This division comprises an irrigable area of about 24,000 acres which has been included in the Langell Valley irrigation district; about 10,000 acres can be irrigated from the Clear Lake Reservoir and about 14,000 acres from the proposed Horsefly Reservoir. During 1921 investigations were made for a diversion dam on Lost River and for a canal system to serve the lands irrigable from the Clear Lake Reservoir. On March 27, 1922, a joint contract was executed with the Langell Valley and Horsefly districts, which provides for the construction of irrigation works to the extent of \$368,000, and for the sale of Clear Lake storage at the rate of \$12.50 per acre for the irrigation of 8,300 acres. Practically all of the lands are in private ownership. Final surveys and other investigations for construction were begun early in 1922. Construction of the diversion dam and canal will be begun shortly after July 1, 1922. These should be completed prior to June 30, 1923.

#### KLAMATH PROJECT: PUMPING DIVISION.

The lands included in the pumping division have a total area of about 20,000 acres. There are 14 separate areas adjacent to project canals; these range in size from about 200 to 6,000 acres. The proposed lifts are from 15 to 70 feet; all of the lands are in private ownership. Some of the areas have been formed into irrigation districts; others propose to form districts for the purpose of contracting with the United States for the delivery of water. During the past year the United States replaced an old timber flume on the C Canal with a flume of reinforced concrete; the United States also constructed the C-G Canals. In both of the above structures capacity has been provided for the lands in the pumping division. Contracts are pending for capacity in the main canal and enlargement of the branch canals for use of the districts, the districts to finance and construct the required pumping plants and distribution system.

#### SOUTH DAKOTA.

##### CHICKEN CREEK RESERVOIR.

Report on the proposed storage for lands under the Red Water Canal and above the Belle Fourche project storage was submitted to the board of directors of the Belle Fourche Valley Water Users' Association on June 27, 1921, at which time the board passed a resolution deferring further action on securing a supplemental water supply for lands under the inlet canal and Johnston lateral. This request was approved by the director on July 22, 1921, and no further work has therefore been done except keeping record of water supply available for such storage.

**TEXAS.****LOWER RIO GRANDE PROJECT.**

At the request of the Lower Rio Grande Water Users' Association and a number of the water improvement districts the Reclamation Service reviewed a scheme proposed for the irrigation of lands above Weslaco. The plan suggested provided for a single pumping plant located a few miles below Rio Grande City to deliver water into a desilting basin, to be formed by dikes and a high canal bank. From the lower end of this basin the cleared water was to be delivered to present distributing systems of the various districts through a feeder canal. The maximum area that could be supplied by the proposed works is approximately 166,000 acres, of which 85,700 acres are now irrigated. No surveys of proposed canal lines, settling basin, or pump sites had been made or any designs for structures and mechanical equipment prepared, so no reliable estimate of costs could be determined, but rough calculations indicated that they would be comparatively high. From the best information available, it appeared that the probable life of the proposed desilting basin would be too short to warrant the indicated construction costs and that the saving in operating expenses would not be enough to pay the interest on the bonds that would have to be issued. For these reasons, and on account of the unsettled condition of water rights in the lower Rio Grande Valley, it was concluded that the "associated districts" would not be justified, at this time, in carrying out the plan proposed.

**LOWER RIO GRANDE VALLEY DRAINAGE AND FLOOD CONTROL.**

The investigations undertaken under the contract with the Rio Grande Valley Chamber of Commerce were continued. The work included additional topographic surveys, tabulation and analysis of available data, establishing gaging stations and preparing comprehensive maps of the area subject to floods, showing natural drainways and possible locations for artificial outlets. A reconnaissance was made on the Mexican side of the river from Reynosa to the Gulf to determine irrigation possibilities, the extent of overflow lands, and possible flood outlets. Investigations were still in progress.

**RED BLUFF RESERVOIR.**

A contract was entered into May 31, 1922, between the United States and the Pecos Valley Water Users' Association of Texas for financing a geological examination of the Red Bluff Reservoir site situated on the Pecos River about 3 miles above the New Mexico-Texas State line. A field examination of the reservoir was made by N. H. Darton, geologist, United States Geological Survey, in December, 1921. In January, 1922, he submitted a preliminary report recommending the drilling of two holes at the dam site to determine the underlying formation. The drilling of these two holes was completed June 21, 1922, and the cores and samples recovered from them were sent to the United States Geological Survey, Washington, for chemical treatment. The boring of additional holes was in progress.

## UTAH.

## CASTLE PEAK PROJECT.

Run-off records for securing water-supply data were continued.

## GREEN RIVER PROJECT.

This project was investigated under a cooperative contract dated May 17, 1921, between the United States and the Salt Lake City Commercial Club and Chamber of Commerce. Field work was initiated in May, 1921, and report rendered and approved by the director January, 1922. Stadia traverse surveys from the mouth of the Price River to the mouth of the San Rafael River indicated that long tunnels would be necessary if a canal was built in the Gray Canyon of the Green River, long discharge pipes would be required from a direct connected pumping plant to the contour canals in the valley, and the canals would be in very difficult construction until well out on the desert from the Book Cliffs. A soil survey indicated 15,000 acres irrigable of the 77,300 acres inclosed by contour canals with initial water surface 250 feet above the Green River beginning 2 miles north of Gunnison Butte. Conclusions of the investigation:

(a) The water supply is adequate for irrigating 15,000 acres with a direct connected pumping plant.

(b) The soil is not of a first-class nature, the best portions being located on the east side of the Green River.

(c) The best proposition, taking into consideration the future power possibilities and the interests of the whole Gunnison Valley, is a 12,700-acre project, 9,200 acres on the east side (which includes the land under the abandoned Elgin Canal) and 3,500 acres on the west side of the Green River, the estimated cost being \$2,320,000, or \$183 per acre.

(d) The most compact project to build is the 9,200-acre project on the east side of the Green River, the estimated cost being \$1,650,000, or \$179 per acre.

(e) The Green River project is not feasible at this time on account of the high construction cost, small acreage, and low returns from the project's products.

## SALT LAKE BASIN INVESTIGATIONS.

These investigations are being conducted under a cooperative contract dated January 3, 1922, between the United States and the State of Utah. Field work has been in progress since April, 1922, being concentrated principally on the Weber River portion. Various reservoir sites on the Weber River are being investigated and fly lines for high-line canals run out to water land in the Sand Ridge and Birch Creek bench localities. A field party has made a rapid fly-line reconnaissance for diverting the Weber River to the Provo River in the vicinity of Kamas, Utah. The report will be made during the fiscal year 1923.

## UTAH-COLORADO.

## LOWER WHITE RIVER INVESTIGATIONS.

A rapid reconnaissance trip over what is locally known as "Dead-man's Bench," north of the White River, was made in June, 1922. A large body of good bench land is situated in the locality, and it is proposed to investigate the feasibility of storage and diversion of the waters of the White River for the irrigation of these lands during the fiscal year 1923.

## WASHINGTON.

## COLUMBIA BASIN PROJECT.

Drilling was carried on in the Columbia River channel at the head of Grand Coulee to determine foundation conditions for a high dam. Granite was found at an average depth of about 100 feet below water level. A dam built at this location would furnish the necessary power to lift water for the project and in addition make a large amount of power available for commercial uses. The Reclamation Service was connected with this work in a consulting capacity only, funds for the field work having been provided by the State of Washington.

## COLUMBIA RIVER POWER INVESTIGATIONS.

A study of the Columbia River Basin with a view to formulating plans for power development along lines that will insure maximum utilization is being conducted by Col. J. B. Cavanaugh, United States Army; D. C. Henny, consulting engineer, United States Reclamation Service; F. F. Henshaw, district engineer, United States Geological Survey, Portland, Oreg.; Marvin Chase, supervisor of hydraulics for State of Washington; C. S. Heidel, State engineer of Montana; and W. G. Swendsen, State commissioner of reclamation for Idaho. The report when completed will be made to the Federal Power Commission.

## YAKIMA PROJECT EXTENSIONS.

Located in south central Washington, in Kittitas, Benton, and Yakima Counties, the proposed extensions to the Yakima project include four divisions as follows: Kittitas (70,000 acres), Moxee (36,750 acres), Roza (58,350 acres), Kennewick (35,000 acres). These districts have contracted with the United States for a storage water supply. Funds were advanced to the United States by the Kennewick, Moxee, and Roza divisions, through the respective irrigation district organizations, for making surveys and estimates of cost. Reports and estimates have been completed.

The Kittitas division, organized as the Kittitas reclamation district, has been engaged during the past year on revision of surveys and estimates for construction which were made several years ago. This work is nearing completion. The Kennewick irrigation district (Kennewick division) has carried through to successful conclusion its condemnation suit to acquire water rights and property at the Prosser Dam, needed in connection with its development, and has made good progress in securing right of way for its power canal. The district is now ready to proceed as soon as the required funds

for the construction of the pumping plant and distribution system can be financed.

Although the unit costs for reclamation are shown by the reports to be very high, the agricultural conditions are exceedingly favorable.

#### WYOMING.

##### ALCOVA-CASPER PROJECT.

Under a cooperative agreement dated June 20, 1921, this project was investigated as to feasibility and cost. A diversion dam on the North Platte River at Alcova, about 135 feet in height, is proposed, with a main canal some 103 miles in length on the west or north side of the river. Test borings by diamond drill were made at the dam site, but owing to limited funds the borings were not conclusive. The most difficult portions of the line of the main canal were surveyed and mapped. These include four large tunnels and five large siphons. The cost of the project was estimated on the basis of an assumed irrigable area of 100,000 acres. The correct irrigable area is to be determined after completion of a soil survey which was in progress.

##### SARATOGA-ENCAMPMENT PROJECT.

Under agreement dated April 29, 1921, an investigation was carried on during the summer of 1921 in the upper North Platte River Valley. The agreement confined this investigation to the Saratoga-Encampment Valley, in Carbon County, Wyo. This territory has about 150,000 acres of arable land, 60,000 acres of which are irrigated. The watered lands lie adjacent to the main river and on the first benches above the stream and receive water largely from diversions on the tributaries of the North Platte River. A number of trial lines for canals were run to reach the higher lands and as a result two possible projects were developed. These are known as the Encampment project and the Saratoga project.

The Encampment project contains 18,000 acres of irrigable land which lies west of the North Platte River and east of the town of Encampment. The water supply is to come from Big Creek, a tributary of the North Platte. This project will require storage, which can be secured at the Casteel site situated on a branch of Big Creek.

The Saratoga project lands lie on the east side of the river and extend from Walcott, on the Union Pacific Railway, to a point 18 miles above Saratoga. The water supply for this project will come from the direct flow of the North Platte River. The irrigable area is 38,200 acres.

The results and conclusions, including water supply studies in connection with these investigations, are included in a report in course of preparation.

*Financial data for secondary project investigations.*

	Deschutes.	Colorado River.	Other projects.	Total.
Appropriations, fiscal year 1922:				
All congressional authorizations.....	<sup>1</sup> \$400,040.93	.....	\$319,098.30	\$719,139.23
Encumbrances, disbursements, and liabilities.....	8,351.94	.....	238,428.10	236,779.94
Unexpended balances July 1, 1922.....	391,689.09	.....	90,670.20	482,359.29
Fiscal year 1922, amount specified in appropriation act.....	.....	\$100,000.00	100,000.00	200,000.00

<sup>1</sup> Appropriation was for the purpose of beginning construction, which plan was abandoned. This project is therefore reported with secondaries.

	Deschutes.		Imperial Valley.		Other investigations.		Total.	
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.
Net cost of investigations....	\$6,022.52	\$8,386.39	\$2,606.62	\$40,755.29	\$230,732.23	\$1,609,337.48	\$239,361.37	\$1,748,479.16
Less funds advanced.....	.....	.....	.....	30,000.00	164,706.78	376,135.62	164,706.78	406,135.62
Balance....	6,022.52	8,386.39	2,606.62	10,755.29	66,025.45	1,233,201.86	74,654.59	1,342,343.54
Investment to date:								
Reclamation fund—								
Disbursements and net transfers	6,270.90	903.77	1,132.30	51,990.75	218,458.87	1,644,225.31	226,862.07	1,697,119.63
Less collections.	.15	.15	.....	45,650.85	187,093.48	440,981.06	187,093.63	496,632.06
Net investment....	6,270.75	903.62	1,132.30	6,339.90	31,455.39	1,203,244.25	38,858.44	1,210,487.77
Increase of compensation (net).	41.26	42.93	31.25	2,467.65	6,450.95	24,858.68	6,523.45	27,366.26

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To apply on net cost of investigations: Funds advanced— Imperial Valley..... Other secondary investigations.....		\$30,000.00		\$30,000.00		
Revenues: Rentals of grazing and farming lands— Deschutes..... Other secondary investigations.....	\$164,706.78	376,135.62	\$158,945.27	342,177.12		\$33,968.50
Other collections: Deschutes..... Imperial Valley..... Other secondary investigations.....	45,744.08	133,886.83	27,486.81	98,142.54	\$7,407.29 35,090.38	653.91
Grand total collections...			187,003.28	496,632.06		

## INDIAN IRRIGATION PROJECTS.

(These projects are being built under a cooperative working agreement between the Reclamation Service and the Office of Indian Affairs, whereby the Reclamation Service forces have charge of the work on the ground and report to the Director of the Reclamation Service, who advises the Commissioner of Indian Affairs of details. The Indian Service sets the general policy to be followed and determines the rate of progress through the medium of the estimates for the annual appropriations in the Indian appropriation bill.)

### MONTANA, BLACKFEET (INDIAN) PROJECT.

R. M. SNELL, project manager, Browning, Mont.

The Blackfeet project is located in Glacier and Pondera Counties and is served by the Great Northern Railway. The source of water supply is Two Medicine River, and Cutbank, Badger, Birch, Whitetail, and Blacktail Creeks. Project towns are Browning, Blackfoot, Cutbank, and Valier. Rainfall averages about 12 inches, and the temperature ranges from an average low of  $-35^{\circ}$  F. to  $90.5^{\circ}$  F. The elevation of the irrigable area is 3,850 feet above sea level; the soil is principally a rich sandy loam with some gravelly loam and gumbo. The principal products are hay, grain, and vegetables; and principal markets, Great Northern Railway towns from St. Paul to the Pacific coast. The irrigation plan provides for the diversion of water from several streams through six canal systems, and for the use of four reservoirs, two of which are now constructed to part capacity.

### SUMMARY OF DATA FOR BLACKFEET (INDIAN) PROJECT TO END OF FISCAL YEAR 1922.

<b>Area and crops:</b>		
Irrigable acreage when project is complete.....	107,500	
Indian land, June 30, 1922.....	107,500	
Average service could supply, season of 1921.....	20,900	
Average irrigated, season of 1921.....	14,650	
Average cropped under irrigation, season of 1921.....	14,650	
Value of irrigated crops, season of 1921.....	\$192,733	
Value of irrigated crops per acre cropped.....	\$13.15	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations, less reduction Director of		
Budget.....	\$28,791.61	
Encumbrances, disbursements and liabilities.....	38,791.61	
Fiscal year 1922, amount specified in appropriation act.....		\$30,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$24,443.24	\$1,144,360.60
Less water-right contracts <sup>1</sup> .....	8,926.35	13,672.86
Balance.....	15,516.89	1,130,687.75

<sup>1</sup> Nominal construction assessment pending completion of project and determination of total charge per acre.

	Indian funds.	Increase of compensa- tion.	Judgments, Court of Claims.	Total.
<b>Investment to date:</b>				
Disbursements and net transfers.....	\$1,198,007.31	\$11,564.85	\$29.91	\$1,209,602.07
Less collections.....	38,952.24			38,952.24
Net investment.....	1,159,145.07	11,564.85	29.91	1,170,739.83



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*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected, June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost, water-right charges.....	\$9,426.35	\$13,672.85	\$1,625.58	\$2,121.00	.....	\$11,551.85
Revenues, rentals of irrigating water.....	15,180.25	31,959.89	12,018.25	21,756.39	.....	10,203.50
Miscellaneous uncollected.....					.....	187.12
Other miscellaneous collections.....			2,391.59	15,074.85	.....	
Grand total collections.....			16,035.42	38,952.24	.....	

## ACTIVITIES DURING FISCAL YEAR.

*Badger-Fisher division.*—Minor timber structures were placed, 6 miles of permanent telephone line were constructed, the timber outlet structure at Four Horns Reservoir was remodeled and slightly enlarged, and construction was commenced on a canal from Four Horns Reservoir to Blacktail Creek.

*Operation and maintenance.*—The Two Medicine, Badger Fisher, Piegan, and Birch Creek divisions were operated during the season of 1921. Water was delivered on a rental basis. The demand was over 50 per cent greater than ever before. More water than could be delivered through the main canal could have been used to advantage on the Two Medicine division. But if all of the water that could have been delivered had been used to advantage the shortage would have been very slight.

*Operation data, Blackfeet project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which the Service was prepared to furnish water.....	20,000	21,500	21,500	21,500	21,500	20,900
Acreage irrigated.....	2,102	2,448	3,484	9,787	9,937	14,650
Miles of canal operated.....	109	125	152	199	192	255
Water diverted (acre-feet).....	7,036	21,284	22,324	38,319	22,133	45,282
Water delivered to land (acre-feet).....	1,735	2,663	6,205	14,000	8,955	19,674
Per acre of land irrigated (acre-feet).....	.83	1.08	1.88	1.43	.90	1.34

<sup>1</sup> The 20,900 acres reported here is the amount that can be supplied through canals now constructed. The decrease from the amount given last year is due to reclassification of some of the lands. Lateral systems are complete except for minor structures and lateral extensions to reach 48,240 acres.

*Settlement data, Blackfeet project.*

Item.	1915	1916	1917	1918	1919	1920	1921
Total number of farms on project.....	3,000	3,000	3,000	3,000	2,900	2,900	2,900
Number of irrigated farms.....	18	79	91	125	329	351	497
Operated by owners or managers.....	16	79	84	76	95	151	172
Operated by tenants.....	2	.....	7	49	234	251	325
Population.....	50	170	180	229	299	319	435
Number of towns.....	4	4	4	4	4	4	4
Population.....	375	1,750	1,900	2,000	3,350	3,000	2,725
Total population in towns and on farms.....	425	1,920	2,070	2,229	3,649	3,319	3,160
Number of schools.....	1	5	3	4	6	6	7
Number of churches.....	3	8	8	8	8	8	8
Number of banks.....	.....	3	4	4	6	5	4
Capital stock.....	.....	.....	.....	.....	.....	\$130,000	\$120,000
Deposits.....	.....	.....	.....	.....	.....	\$851,600	\$608,000
Depositors.....	.....	.....	.....	.....	.....	2,257	1,790

# MONTANA, FLATHEAD (INDIAN) PROJECT.

C. J. MOODY, project manager, St. Ignatius, Mont.

The Flathead project is located in western Montana in Flathead, Missoula, and Sanders Counties, on the Northern Pacific Railway. There are 15 towns on the project with a total population of 5,500. The source of water supply is from about 70 creeks flowing from the mountains which surround the irrigable lands. The elevation of the irrigable area is 3,000 feet above sea level. The range of temperature is from an average maximum of 96° F. to an average minimum of -21° F. The character of soil on the Jocko division is a gravelly loam; on the Camas and Mission Valley divisions, clay and sandy loam. The irrigation season is from May 1 to September 30, 153 days. Duty of water in acre-feet per annum is 2.75 on the Jocko division and 1.5 on the Camas and Mission Valley divisions. The principal products are hay, grain, vegetables, and fruit. The principal markets are Butte and Missoula, Mont.; Spokane, Wash.; and local mining towns and lumber camps.

The Jocko division includes about 12,000 acres of land irrigated by diversion of the natural flow of Jocko River and tributaries without storage. The Camas division includes about 10,500 acres of land lying along the west side of Little Bitterroot River, which is the water supply. Storage is obtained in Little Bitterroot Lake, where a reservoir of 18,000 acre-feet capacity has been constructed; at the Hubbard Reservoir site, with proposed capacity of 12,000 acre-feet not yet constructed; and at Dry Fork Reservoir, proposed capacity 3,400 acre-feet, which has been constructed to 2,000 acre-feet capacity. The Mission Valley division consists of about 102,000 acres, for which the water supply comes from creeks rising in the Mission Mountains, supplemented by the surplus waters of the Jocko River. Ten reservoirs are proposed with a total capacity of 105,000 acre-feet, of which five are constructed to part capacity with 38,000 acre-feet now available for storage. A feed canal 45 miles in length along the foot of the Mission Mountains has been constructed to collect the water from the several streams.

## SUMMARY OF DATA FOR FLATHEAD (INDIAN) PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
- Irrigable acreage when project is complete.....		124,500
Public land entered to June 30, 1922.....	43,008	
State land unsold on June 30, 1922.....	862	
Indian land, June 30, 1922.....	34,289	
Private land, June 30, 1922.....	46,341	
Acreage service could supply, season of 1921.....		105,500
Acreage irrigated, season of 1921.....		30,485
Acreage cropped under irrigation, season of 1921.....		28,821
Value of irrigated crops, season of 1921.....		\$456,588.10
Value of irrigated crops per acre cropped.....		\$15.84
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922, all congressional authorizations.....	\$227,426.82	
Fiscal year 1923, all congressional authorizations.....	200,000.00	
	\$427,426.82	
Encumbrances, disbursements, and liabilities.....	230,147.67	
Unencumbered balance July 1, 1922.....		\$197,279.15

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$145,560.37	\$4,491,586.70
Less water-right contracts, <sup>1</sup> project lands (96,615.15 acres).....	48,263.33	62,412.26
Balance.....	97,297.04	4,429,174.44

<sup>1</sup> Nominal construction assessment, pending completion of project and determination of total charge per acre.

	Indian funds.	Increase of compensation.	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$4,661,014.41	\$136,702.95	\$4,797,717.36
Less collections.....	182,751.84		182,751.84
Net investment.....	4,478,262.57	136,702.95	4,614,965.52

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*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected, cash.		Uncollected June 30, 1922.
	Fiscal year 1922.	To June 30, 1922.	Fiscal year 1922.	To June 30, 1922.	
To return net construction cost, water-right charges.....	\$48,263.33	\$62,412.26	\$9,235.78	\$13,651.07	\$48,761.19
Construction water-right charges paid in advance.....				43.22	
<b>Revenues:</b>					
Rentals of irrigating water.....	43,497.14	167,046.98	22,334.35	117,857.90	49,186.06
Rentals of grazing and farming lands.....		3,450.00		3,450.00	
<b>Total.....</b>	<b>43,497.14</b>	<b>170,496.98</b>	<b>22,334.35</b>	<b>121,307.90</b>	<b>49,186.06</b>
Miscellaneous uncollected.....					594.24
Other miscellaneous collections.....			16,920.56	47,749.65	
<b>Grand total collections.....</b>			<b>48,490.69</b>	<b>182,761.84</b>	

## ACTIVITIES DURING FISCAL YEAR.

Concrete lining of the Dry Creek Canal was finished, involving the finishing to neat lines of 20,700 linear feet of a 250 second-foot canal and placing 270,000 square feet of 3-inch concrete lining reinforced with rectangular mesh reinforcement.

*Operation and maintenance.*—Precipitation for the year 1921 was  $3\frac{1}{4}$  inches below normal, but there was no shortage of water, largely due to hold-over water in several reservoirs. Precipitation during the irrigation season amounted to 4.99 inches. The tendency among the farmers now is to turn to dairying. For the first time in the history of the project the acreage of alfalfa fields irrigated exceeded that of wheat.

*Operation data, Flathead project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water (storage incomplete).....	66,000	80,300	84,300	91,000	98,000	105,500
Acreage irrigated.....	4,372	15,863	27,128	34,458	32,836	30,485
Miles of canal operated.....	232	364	674	741	750	713
Water diverted (acre-feet).....	23,942	54,353	84,358	112,112	80,961	105,422
Water delivered to the land (acre-feet).....	5,751	21,691	34,666	50,607	40,958	47,445
Per acre of land irrigated (acre-feet).....	1.32	1.37	1.28	1.47	1.25	1.35

*Settlement data, Flathead project.*

Item.	1917	1918	1919	1920	1921
Total number of irrigable farms.....	2,630	2,630	2,630	2,000	2,030
Population.....	14,500	14,500	14,500	15,000	14,000
Number of irrigated farms.....	567	833	850	1,028	1,105
Operated by owners or managers.....	425	670	650	799	944
Operated by tenants.....	142	163	200	229	161
Population.....	1,319	1,679	1,700	2,380	2,302
Number of towns.....	12	14	14	14	15
Population.....	4,000	4,325	5,250	5,445	5,500
Total population in towns and farms.....	18,500	18,825	19,750	20,445	19,500
Number of public schools.....	55	60	55	45	45
Number of churches.....	15	15	16	19	19
Number of banks.....	9	11	11	11	11
Total capital stock.....	\$205,000	\$221,000	\$250,000	\$287,000	\$287,000
Amount of deposits.....	\$1,283,988	\$1,011,177	\$1,316,907	\$1,457,645	\$1,238,117
Number of depositors.....	4,608	4,384	4,656	4,447	4,301

<sup>1</sup> Estimated.

# MONTANA, FORT PECK (INDIAN) PROJECT.

S A. KERR, project manager, Poplar, Mont.

The Fort Peck project is located almost entirely within the Fort Peck Indian Reservation in northeastern Montana. Five principal irrigation systems have been outlined as follows: Big Porcupine division, comprising about 4,000 acres, to be supplied with water from Big Porcupine Creek, the natural flow to be supplemented by storage; Little Porcupine division of 2,000 acres, to be supplied by storage of the flood waters of Little Porcupine Creek; Poplar division of about 30,000 acres, located in Poplar River Valley, to be supplied from the natural flow of Poplar River supplemented by storage; Big Muddy division of 16,000 acres to be supplied by the natural flow of Big Muddy, Smoke, and Wolf Creeks supplemented by storage; and Missouri division of 84,000 acres to be served by a gravity canal from the Missouri River. It was also found possible to irrigate about 18,000 acres by pumping from the Missouri Canal with lifts of from 12 to 20 feet.

The average elevation of the project lands is 2,000 feet above sea level. Winters are rather long and severe but the summers are quite warm with plenty of sunshine so that the length of the actual growing season compares favorably with that of many of the projects farther south. The soil is fertile and deep and varies from a heavy clay to a sandy loam. The rainfall, which varies widely from year to year and is rather erratically distributed throughout the growing season, averages a little over 13 inches for the years 1886 to 1921.

## SUMMARY OF DATA FOR FORT PECK (INDIAN) PROJECT TO END OF FISCAL YEAR 1922.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		152,000
Public land entered to June 30, 1922.....	\$, 713	
Public land open to entry on June 30, 1922.....	107	
Public land withdrawn on June 30, 1922.....	100	
State land unsold on June 30, 1922.....	80	
Indian land, June 30, 1922.....	132,000	
Private land, June 30, 1922.....	10,000	
Acreage service could supply, season of 1921.....		20,762
Acreage irrigated, season of 1921.....		1,021
Acreage cropped under irrigation, season of 1921.....		894
Acreage dry-farmed, season of 1921.....	about..	2,000
Value of irrigated crops, season of 1921.....		\$13,213
Value of irrigated crops per acre cropped.....		\$14.75
Value of dry-farmed crops, season of 1921.....	about..	\$10,000
Value of dry-farmed crops per acre cropped.....	about..	\$5.00
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1922; all Congressional authorizations.....	\$32,670.18	
Encumbrances, disbursements, and liabilities.....	20,898.93	
Unencumbered balance July 1, 1922.....		\$11,771.25
Fiscal year 1923, amount specified in appropriation act.....		19,000.00

	Fiscal year 1922.	To June 30, 1922.
<b>Irrigation works:</b>		
Net construction cost.....	\$39,467.19	\$866,121.14
Less water-right contracts <sup>1</sup> .....	7,557.15	8,260.65
Balance.....	31,910.04	857,860.49

<sup>1</sup> Water right contracts cover charge of 50 cents an acre on land irrigated for 1920 and 50 cents an acre on all land under ditches, allotted or owned, for 1921.

	Indian funds.	Increase of compensa- tion.	Judgments Court of Claims.	Total.
<b>Investment to date:</b>				
Disbursements.....	\$890,221.62	\$16,176.13	\$168.34	\$906,566.09
Less collections.....	23,717.12			23,717.12
Net investment.....	866,504.50	16,176.13	168.43	882,848.97

*Status of current accounts receivable as of June 30, 1922.*

	Due.		Collected.			Uncollected, June 30 1922.
	Fiscal year 1922.	To June 30, 1922.	Cash.		Other credits to June 30, 1922.	
			Fiscal year 1922.	To June 30, 1922.		
To return net construction cost, water-right charges.....	\$7,557.00	\$8,260.65	\$165.00	\$497.24	.....	\$7,763.41
Revenues:						
Rentals of irrigating water.....	1,042.00	4,055.67	435.00	2,835.15	\$69.15	1,151.37
Rentals of grazing and farming lands.....	83.00	406.00	83.00	406.00	.....	.....
Total.....	1,125.00	4,461.67	518.00	3,241.15	69.15	1,151.37
Miscellaneous uncollected.....			13,012.81	19,978.73	.....	11,504.40
Other miscellaneous collections.....						
Grand total collections.....			13,725.81	23,717.12	.....	

**ACTIVITIES DURING FISCAL YEAR.**

Construction comprised the completion of a siphon on Poplar C Canal and minor structures for an additional area of 2,000 acres on Big Muddy division.

*Operation and maintenance.*—Only a little over 1,000 acres were irrigated in 1921, although there was no shortage of water on any of the four divisions. This decreased area, as compared with the previous year, reflects the heavier rainfall of 1921, which was 14.9 inches as compared with 9.3 inches in 1920. With the exception of the first 15 days of June, precipitation for the first half of 1922 was favorable for crops, and as most of the irrigated acreage is in native hay which is watered early in the season, indications are that the irrigated area this year will be less than that for 1921. The operation of the project for such a small irrigated acreage, 1,000 acres out of over 22,000 acres under constructed ditches, has resulted in an operation deficit each year, and unless the area irrigated can be greatly increased, each succeeding year will probably add to this deficit.

The ownership of the land involved makes the problem of increasing the irrigated acreage difficult. Of the 22,800 acres under canals 2,450 acres are owned by whites, 2,800 acres by Indians under fee patent, 9,000 acres by Indians under trust patent, 2,550 acres are deceased Indian lands and 6,000 acres are unallotted tribal lands. As the unallotted lands will soon be allotted under trust patent, there will remain out of the 22,800 only 7,800 acres which can be bought and sold. Of this, 5,250 acres can be had by dealing with individual whites and Indians and 2,550 acres through the local Indian office. As many of the Indian allottees are old Indians, minors, or nonresidents and those on the land are not very strongly inclined toward farming, development of the project will have to be by experienced white irrigators from outside the project. Under the present ownership conditions it is difficult to secure these experienced irrigators. In the first place there is little land available for them, and, in the second place, they do not like the prospect of having to bear the major burden of taxation for schools, roads, and other public

improvements, for, whereas all trust patent lands are exempt from taxation, the newcomers, who have first to buy their land outright at once become taxpayers. This burden they must continue to bear for some time as the first trust patents do not expire until 1940 and those for the new allotments can not expire much before 1950 if the trust period is made 25 years as it was in the first allotment.

With the Indians making little use of their land and with such difficulties in the way of experienced irrigators such as must be depended upon to demonstrate the feasibility of the project and make of it an ultimate success, prospects for the immediate development of the project are not bright and there seems small chance for improvement until the major portion of the land is made available for proper settlement.

*Operation data, Fort Peck project, by calendar years.*

Item.	1916	1917	1918	1919	1920	1921
Acreage for which service was prepared to supply water.....	12,620	14,220	16,620	16,620	16,620	20,762
Acreage irrigated.....	1,092	1,602	1,299	1,047	1,568	1,021
Miles of canals operated.....	85	126	158	158	158	158
Water diverted (acre-feet).....	3,500	3,600	3,000	3,000	3,600	3,000
Water delivered to land (acre-feet).....	2,250	1,550	1,400	2,000	2,000	1,800
Per acre of land irrigated (acre-feet).....	1.5	1.2	1.08	1.9	1.3	1.8

*Settlement data, Fort Peck project.*

Item.	1915	1916	1917	1918	1919	1920	1921
Total number of allotments on project (irrigable).....	1,780	1,780	1,780	1,780	1,780	1,780	1,780
Population (Indian).....	2,046	2,092	2,130	2,160	2,157	2,070	2,150
Number of irrigated farms.....	42	48	58	66	62	70	35
Operated by owners or managers.....	40	46	57	60	37	45	33
Operated by tenants.....	2	2	1	6	25	25	2
Population.....	110	130	134	130	110	150	150
Number of towns.....	5	5	5	5	5	5	5
Population (white).....	1,780	2,200	2,650	3,500	4,850	5,000	5,000
Total population in towns and on farms.....	1,890	2,330	2,784	3,630	4,960	5,150	7,150
Number of schools:							
Indian.....	5	5	5	5	4	4	2
White.....	3	5	5	5	5	5	5
Number of churches.....	7	7	8	9	9	10	10
Number of banks.....	5	4	6	9	9	9	6
Total capital stock.....	\$105,000	\$110,000	\$130,000	\$185,000	\$225,000	\$225,000	\$145,000
Amount of deposits.....	\$234,000	\$477,000	\$580,000	\$1,095,000	\$1,555,000	\$1,700,000	\$1,150,000
Number of depositors.....	1,400	1,970	2,630	3,700	4,500	4,700	3,200

## APPENDIX.

### LEGISLATION.

#### EXCHANGE OF LANDS ON NORTH PLATTE PROJECT.

An act providing for an exchange of lands between the Swan Land and Cattle Company and the United States. [Act Aug. 9, 1921, Public No. 44, 42 Stat. 147.]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That upon proper execution and delivery by the Swan Land and Cattle Company, Limited, a corporation, of a deed conveying to the United States, its successors and assigns, a good merchantable title in fee, free of incumbrance to certain lands needed by the United States for construction, operation, and maintenance purposes, in connection with the North Platte irrigation project, Nebraska Wyoming, to wit: The southwest quarter of the northeast quarter and the southeast quarter of the northwest quarter of section twenty-five, township twenty-five north range sixty-three west, sixth principal meridian, Wyoming; then in exchange for such lands so conveyed a patent shall be issued by the United States to said Swan Land and Cattle Company, its successors and assigns, conveying to said company the northeast quarter of the northeast quarter of section twenty-six and the northeast quarter of the southwest quarter of section twenty-three, township twenty-five north range sixty-three west, sixth principal meridian.

#### CONGRESS CONSENTS TO AGREEMENT BETWEEN STATES RESPECTING WATERS OF COLORADO RIVER.

An act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes. [Act Aug. 19, 1921, Public No. 56, 42 Stat. 171.]

Whereas the Colorado River and its several tributaries rise within and flow through or from the boundaries between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming; and

Whereas the territory included within the drainage area of the said stream and its tributaries is largely arid and in small part irrigated, and the present and future development necessities and general welfare of each of said States and of the United States require the further use of the waters of said streams for irrigation and other beneficial purposes, and that future litigation and conflict respecting the use and distribution of said waters should be avoided and settled by compact between said States; and

Whereas the said States, by appropriate legislation, have authorized the governors thereof to appoint commissioners to represent said States for the purpose of entering into a compact or agreement between said States respecting the future utilization and disposition of the waters of the Colorado River and of the streams tributary thereto; and

Whereas the governors of said several States have named and appointed their respective commissioners for the purposes aforesaid, and have presented their resolution to the President of the United States requesting the appointment of a representative on behalf of the United States to participate in said negotiations and to represent the interests of the United States: Now, therefore,

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That consent of Congress is hereby given to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to negotiate and enter into a compact or agreement not later than January 1, 1923, providing for an equitable division and apportionment among said States of the water supply of the Colorado River and of the streams tributary thereto, upon condition that a suitable person, who shall be appointed by the President of the United States, shall participate in said negotiations, as the representative of and for the protection of the interests of the United States, and shall make report to Congress of the proceedings and of any compact or agreement entered into, and the sum of \$10,000, or so much thereof as may be necessary, is hereby authorized to be appropriated to pay the

salary and expenses of the representative of the United States appointed hereunder: *Provided*, That any such compact or agreement shall not be binding or obligatory upon any of the parties thereto unless and until the same shall have been approved by the legislature of each of said States and by the Congress of the United States.

Sec. 2. That the right to alter, amend, or repeal this act is herewith expressly reserved.

### PREFERRED RIGHT OF ENTRY FOR SOLDIERS.

Joint resolution to amend a joint resolution entitled "Joint resolution giving to discharged soldiers, sailors, and marines a preferred right of homestead entry," approved February 14, 1920. (Pub. Res. No. 36, Jan. 21, 1922, 42 Stat. —.)

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled*, That a joint resolution entitled "Joint resolution giving to discharged soldiers, sailors, and marines a preferred right of homestead entry," approved February 14, 1920, be, and the same is hereby, amended to read as follows:

"That hereafter, for the period of ten years following the passage of this Act, on the opening of public or Indian lands to entry, or the restoration to entry of public lands theretofore withdrawn from entry, such opening or restoration shall, in the order therefor, provide for a period of not less than ninety days before the general opening of such lands to disposal in which officers, soldiers, sailors, or marines who have served in the Army or Navy of the United States in the war with Germany and have honorably separated or discharged therefrom or placed in the Regular Army or Naval Reserve shall have a preferred right of entry under the homestead or desert land laws, if qualified thereunder, except as against prior existing valid settlement rights and as against preference rights conferred by existing laws or equitable claims subject to allowance and confirmation: *Provided*, That the rights and benefits conferred by this Act shall not extend to any person who, having been drafted for service under the provisions of the Selective Service Act, shall have refused to render such service or to wear the uniform of such service of the United States."

Sec. 2. That the Secretary of the Interior is hereby authorized to make any and all regulations necessary to carry into full force and effect the provisions hereof.

### RELIEF TO WATER USERS ON FEDERAL IRRIGATION PROJECTS.

An act to authorize the Secretary of the Interior to extend the time for payment of charges due on reclamation projects, and for other purposes. (Act Mar. 31, 1922, Public No. 186, 42 Stat. —.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That where an individual water user or individual applicant for a water right under a Federal irrigation project constructed under the act of June 17, 1902 (Thirty-second Statutes, page 388), or any Act amendatory thereof or supplementary thereto, is unable to pay any construction charge due and payable in the year 1922 or prior thereto, the Secretary of the Interior is hereby authorized, in his discretion, to extend the date of payment of any such charge for a period not to exceed one year from December 31, 1922: *Provided*, That the applicant for the extension shall first show to the satisfaction of the Secretary of the Interior by a detailed verified statement of his assets and liabilities, an actual inability to make payment at the time the application is made and an apparent ability to meet the deferred charge when the extension expires; also in cases where water for irrigation is available, that the applicant is a landowner or entryman whose land against which the charge has accrued is being actually cultivated: *Provided further*, That similar relief in whole or in part may be extended by the Secretary of the Interior to a legally organized group of water users of a project, upon presentation of a sufficient number of individual showings made in accordance with the foregoing proviso to satisfy the Secretary of the Interior that such extension is necessary: *And provided further*, That each charge so extended shall draw interest at the rate of 6 per centum per annum from its due date in lieu of any penalty that may now be provided by law, but in case such charge is not paid at the end of such extension period, any penalty that would have been applicable save for such extension, shall attach from the date the charge was originally due the same as if no extension had been granted.

Sec. 2. That the Secretary of the Interior is hereby authorized, in his discretion, after due investigation, to furnish irrigation water on Federal irrigation projects during the irrigation season of 1922 to landowners or entrymen who are in arrears for more than one calendar year in the payment of any operation and maintenance or construction charges, notwithstanding the provisions of section 6 of the act of August 13, 1914 (Thirty-eighth Statutes, page 686): *Provided*, That nothing in this section shall be construed to relieve any beneficiary hereunder from payments due or penalties thereon required by said act: *Provided further*, That the relief provided by this section shall be extended only to a landowner or entryman whose land against which the charges have accrued is actually being cultivated.



## PATENTS TO DISABLED SOLDIER ENTRYMEN.

An act to amend the Act of March 1, 1921 (Forty-first Statutes, page 1202), entitled "An Act to authorize certain homestead settlers or entrymen who entered the military or naval service of the United States during the war with Germany to make final proof of their entries." [Act April 7, 1922, Public No. 128, 42 Stat., —.]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the act approved March 1, 1921 (Forty-first Statutes, page 1202), be amended to read as follows: "That any bona fide settler, applicant, or entryman under the homestead laws of the United States, or any desert land entryman whose entry is subject to the provisions of the act of June 17, 1902 (Thirty-second Statutes, page 388), who after settlement, application, or entry, and prior to November 11, 1918, enlisted or was actually engaged in the United States Army, Navy, or Marine Corps during the war with Germany, who has been honorably discharged and because of physical incapacities due to the service is unable to return to the land, may make final proof, without further residence, improvement, cultivation, or reclamation, at such time and place as may be authorized by the Secretary of the Interior, and receive patent to the land by him so entered or settled upon, subject to the provisions of the act or acts under which such settlement or entry was made: *Provided*, That no such patent shall issue prior to the conformation of the entry to a single farm unit, as required by the act of August, 13, 1914 (Thirty-eighth Statutes, page 686): *And provided further*, That this act shall not be construed to exempt or relieve such applicant or entryman from the payment of any lawful fees, commissions, purchase moneys, water charges, or other sums due to the United States, or its successors in control of the reclamation project, in connection with such lands."

## RECLAMATION PROVISIONS IN APPROPRIATION ACT FOR DEPARTMENT OF AGRICULTURE.

[Extracts from] An act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1923. [Act May 11, 1922, Pub. No. 217, 42 Stat. —.]

\* \* \* \* \*

*General expenses, Bureau of Plant Industry.*—\* \* \*—For investigations in connection with western irrigation agriculture, the utilization of lands reclaimed under the reclamation act, and other areas in the arid and semiarid regions, \$94,420.

\* \* \* \* \*

*General expenses, Bureau of Soils.*—\* \* \*—For examination of soils to aid in the classification of agricultural lands, in cooperation with other bureaus of the department and other departments of the Government, \$15,000.

\* \* \* \* \*

*General expenses, Bureau of Public Roads.*—\* \* \*—For investigating and reporting upon the utilization of water in farm irrigation, including the best methods to apply in practice; the different kinds of power and appliances, and the development of equipment for farm irrigation; the flow of water in ditches, pipes, and other conduits; the duty, apportionment, and measurement of irrigation water; the customs, regulations, and laws affecting irrigation; for the purchase and installation of equipment for experimental purposes; for the giving of expert advice and assistance; for the preparation and illustration of reports and bulletins on irrigation; for the employment of assistants and labor in the city of Washington and elsewhere; for rent outside of the District of Columbia; and for supplies and all necessary expenses, \$72,000.

For investigating and reporting upon farm drainage and upon the drainage of swamp and other wet lands which may be made available for agricultural purposes; for preparing plans for the removal of surplus water by drainage, and for giving expert assistance by advice or otherwise in the drainage of such lands; for conducting field experiments and investigations concerning the construction and maintenance of farm-drainage work; for investigating and developing equipment intended for the construction and maintenance of farm-drainage structures; for the purchase of materials and equipment; and for preparing and illustrating reports and bulletins on drainage; and for the employment of assistants and labor in the city of Washington and elsewhere; for rent outside of the District of Columbia, and for supplies and all necessary expenses, \$72,260;

*Demonstrations on reclamation projects.*—To enable the Secretary of Agriculture to encourage and aid in the agricultural development of the Government reclamation projects; to assist, through demonstrations, advice, and in other ways, settlers on the projects; and for the employment of persons and means necessary in the city of Washington and elsewhere, \$39,000.

\* \* \* \* \*

## IRRIGATION DISTRICTS AND FARM LOANS ON FEDERAL IRRIGATION PROJECTS.

An act to provide for the application of the reclamation law to irrigation districts. (Act May 15, 1922, Public No. 219, 42 Stat. —.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That in carrying out the purposes of the act of June 17, 1902 (Thirty-second Statutes, page 388), and acts amendatory thereof and supplementary thereto, and known as and called the reclamation law, the Secretary of the Interior may enter into contract with any legally organized irrigation district whereby such irrigation district shall agree to pay the moneys required to be paid to the United States, and in such event water-right applications on the part of landowners and entrymen, in the discretion of the Secretary of the Interior, may be dispensed with. In the event of such contract being made with an irrigation district, the Secretary of the Interior, in his discretion, may contract that the payments, both for the construction of irrigation works and for operation and maintenance, on the part of the district shall be made upon such dates as will best conform to the district and taxation laws of the respective States under which such irrigation districts shall be formed, and if he deem it advisable he may contract for such penalties or interest charges in case of delinquency in payments as he may deem proper and consistent with such State laws, notwithstanding the provisions of sections 1, 2, 3, 5, and 6 of the reclamation extension act approved August 13, 1914 (Thirty-eighth Statutes, page 686). The Secretary of the Interior may accept a partial payment of the amount due from any district to the United States, providing such acceptance shall not constitute a waiver of the balance remaining due nor the interest or penalties, if any, accruing upon said balance: *Provided*, That no contract with an irrigation district under this act shall be binding on the United States until the proceedings on the part of the district for the authorization of the execution of the contract with the United States shall have been confirmed by decree of a court of competent jurisdiction, or pending appellate action if ground for appeal be laid.

SEC. 2. That patents and water-right certificates which shall hereafter be issued under the terms of the act entitled "An act providing for patents on reclamation entries, and for other purposes," approved August 9, 1912 (Thirty-seventh Statutes at Large, page 265), for lands lying within any irrigation district with which the United States shall have contracted, by which the irrigation district agrees to make the payment of all charges for the building of irrigation works and for operation and maintenance, shall not reserve to the United States a lien for the payment of such charges; and where such a lien shall have been reserved in any patent or water-right certificate issued under the said act of Congress, the Secretary of the Interior is hereby empowered to release such lien in such manner and form as may be deemed effective; and the Secretary of the Interior is further empowered to release liens in favor of the United States contained in water-right applications and to assent to the release of liens to secure reimbursement of moneys due to the United States pursuant to water-right applications running in favor of the water users' association and contained in stock subscription contracts to such associations, when the lands covered by such liens shall be subject to assessment and levy for the collection of all moneys due and to become due to the United States by irrigation districts formed pursuant to State law and with which the United States shall have entered into contract therefor: *Provided*, That no such lien so reserved to the United States in any patent or water-right certificate shall be released until the owner of the land covered by the lien shall consent in writing to the assessment, levy, and collection by such irrigation district of taxes against said land for the payment to the United States of the contract obligation: *Provided further*, That before any lien is released under this act the Secretary of the Interior shall file a written report finding that the contracting irrigation district is legally organized under the laws of the State in which its lands are located, with full power to enter into the contract and to collect by assessment and levy against the lands of the district the amount of the contract obligation.

SEC. 3. That upon the execution of any contract between the United States and any irrigation district pursuant to this act the public lands included within such irrigation district, when subject to entry, and entered lands within such irrigation district, for which no final certificates shall have been issued and which may be designated by the Secretary of the Interior in said contract, shall be subject to all the provisions of the act entitled "An act to promote the reclamation of arid lands," approved August 11, 1916: *Provided*, That no map or plan as required by section 3 of the said act need be filed by the irrigation district for approval by the Secretary of the Interior.

That the term "first mortgage," as used in section 12 of the Federal farm loan act, approved July 17, 1916, shall be construed to include mortgages on farm lands under United States reclamation projects, notwithstanding there may be against such lands

a reserved or created lien in favor of the United States for construction or other charge as provided in the act of June 17, 1902, and acts amendatory thereof and supplement thereto, known as the reclamation law: *Provided*, That such lands are otherwise eligible for loans under the Federal farm loan act: *And provided further*, That the amount and date of maturity of such lien shall be given due consideration in fixing the value of such lands for loan purposes.

### APPROPRIATIONS FOR RECLAMATION SERVICE.

[Extract from] an act making appropriations for the Department of the Interior for the fiscal year ending June 30, 1923, and for other purposes. [Act May 24, 1922, Pub. No. 224, 42 Stat. —.]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior for the fiscal year ending June 30, 1923, namely:

\* \* \* \* \*

#### RECLAMATION SERVICE.

The following sums are appropriated out of the special fund in the Treasury of the United States created by the Act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

For all expenditures authorized by the act of June 17, 1902 (Thirty-second Statute, page 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law, and all other acts under which expenditures from said fund are authorized, including salaries in the District of Columbia and elsewhere; examination estimates for appropriations in the field; refunds for over-collections hereafter received on account of water-right charges, rentals, and deposits for other purposes; print and binding; law books, books of reference, periodicals, engineering and statistical publications, not exceeding \$1,500; purchase, maintenance, and operation of horse-drawn or motor-propelled passenger-carrying vehicles; payment of damages caused to the owners of lands or private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior; and payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior:

Salt River project, Arizona: For examination of project and project account \$5,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, \$550,000;

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, \$125,000;

Grand Valley project, Colorado, including Orchard Mesa unit: For operation and maintenance, continuation of construction, and incidental operations, \$440,000;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, \$215,000;

Boise project, Idaho: For operation and maintenance, continuation of construction and incidental operations: *Provided*, That the expenditure for drainage shall not exceed the amount paid by the water users pursuant to the provisions of the Board of public notice dated February 15, 1921, \$1,220,000;

King Hill project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$450,000;

Minidoka project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, with authority in connection with the construction of American Falls Reservoir, to purchase or condemn and to improve suitable land for a new town site to replace the portion of the town of American Falls which will be flooded by the reservoir, and to provide for the removal of buildings to a new site and to plat and to provide for appraisal of lots in such new town site and exchange and convey such lots in full or part payment for property to be flooded by the reservoir and to sell for not less than the appraised valuation any lots not used for such exchange, \$1,200,000;

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$170,000;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$340,000, plus so much of \$350,000 additional

the Secretary of the Interior finds to be available in the reclamation fund on March 1, 1923, in excess of all other appropriations from that fund;

Sun River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$345,000;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$180,000;

North Platte project, Nebraska-Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$1,440,000;

Serlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, \$915,000;

Christed project, New Mexico: For operation and maintenance, continuation of construction, and incidental operations, \$65,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, \$1,000,000;

North Dakota pumping project, North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$115,000;

Baker project, Oregon: For investigation, commencement of construction and incidental operations, \$400,000;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, \$500,000;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, \$700,000;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$350,000;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, \$85,000;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$40,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$1,500,000;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$675,000, plus so much of \$250,000 additional

as the Secretary of the Interior finds to be available in the reclamation fund on March 1, 1923, in excess of all other appropriations from that fund;

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$975,000;

Secondary projects: For cooperative and miscellaneous investigations, \$100,000;

For the continued investigation of the feasibility of irrigation, water storage, and related problems on the Colorado River, and investigation of water sources of said river, \$100,000;

Under the provisions of this act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1923, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1923 exceed the whole amount in the reclamation fund for that fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions, an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1923, the Director of the Reclamation Service, shall find that the expenses of travel can be reduced thereby, he may, in lieu of actual traveling expenses, under such regulations as he may prescribe, authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile, used for necessary travel on official business;

Total, Reclamation Service, \$14,800,000.

For reimbursement to the reclamation fund the proportionate expense of operation and maintenance of the reservoirs for furnishing stored water to the lands in Yakima Indian Reservation, Washington, in accordance with the provisions of section 22 of the act of August 1, 1914 (Thirty-eighth Statutes at Large, page 604), there is appropriated, out of any money in the Treasury not otherwise appropriated, \$11,000.

## LAW DECISIONS.

### DAMAGES.

*Injury to horse.*—By contract dated May 5, 1920, the United States Reclamation Service leased a horse and harness from R. R. Vannoy for use on the Yuma Federal irrigation project in Arizona, at a monthly rental of \$15, the contract providing that the United States should exercise ordinary care in the use of the property. While the horse was being used with ordinary care, he became frightened at the odor, noise, and paraphernalia of a trapper who was passing by, and as a result ran away and was injured in a barbed-wire fence. The Comptroller General held in this case (Comp. Gen. Dec., March 15, 1922) that the proximate cause of this damage was not the "operations of the United States," but circumstances entirely foreign to and in no way connected with such operations, and that therefore there was no liability on the part of the Government under the appropriation act of June 5, 1920 (41 Stat. 913), or independently thereof.

*Liability of Government for seepage.*—The destruction of the property of the owner of a lake through the raising of the lake level, consequent upon the carrying out of a Government irrigation project, can not be said to be a taking, from which an agreement by the United States to make compensation will be implied, where the result of the Government work to the lake owner's property could not have been foreseen or foretold (John Horstmann Co. v. United States, 54 Ct. Claims 169, Natron Soda Co. v. United States, 54 Ct. Claims 214; 66 L. ed. 80.)

*Construction of ditches.*—The right of way act of August 30, 1890 (26 Stat. 391) authorizes the construction of ditches only in the exercise of due care, and the land owner can recover any damages resulting from negligent construction. (United States v. Ide, et al., 277 F. 373.)

### DRAINAGE.

*Drainage works part of irrigation system.*—The United States may construct drainage works as a part of its irrigation system under a Federal irrigation project. The necessity for drainage in connection with such a project and the method of conducting the work are in the sound discretion of the Secretary of the Interior, and his discretion can not be reviewed by the courts. (United States v. Ide et al., 277 F. 373.)

### ENTRIES.

*Additional entry.*—Under the act of June 25, 1910 (36 Stat. 835), as subsequently amended, lands reserved for irrigation purposes are not subject to settlement or entry until the Secretary of the Interior shall have established the unit of acreage per entry and announced that water is ready to be delivered, and no exception to the rule can be made in favor of an applicant who seeks to make an additional entry of such land in the exercise of a preference right acquired by contest. Section 24 of departmental regulations of May 18, 1916 (45 L. D. 385, 390), are obsolete and inoperative. (Beck Scott, North Platte project, 48 L. D. 85; 48 L. D. 113.)

*Relinquishment and withdrawal.*—In United States ex rel. Harden v. Fall, Secretary of the Interior (276 F. 622), the Circuit Court of Appeals of the District of Columbia holds with the appellant Harden that the right, given by section 10 of the act of August 13, 1914 (38 Stat. 686), to enter lands withdrawn for irrigation purposes under the reclamation law if the lands were acquired by a prior entry since relinquished is not limited to those in privity with the original entryman through purchase of the relinquishment or otherwise. The appellant Harden was denied relief, however, on the ground that his entry was initiated at a time when the land was withdrawn under the first form and it was therefore void and could not be made valid by a subsequent order of the Secretary of the Interior declaring the land was not needed for construction purposes.

### LANDS.

*Taxation of public land.*—In the case of Irwin v. Webb (66 L. ed. 333) the United States Supreme Court makes the following holdings regarding the taxation of public land:

Land in a Federal irrigation project constructed under the act of June 17, 1902 (32 Stat. 388), for which a patent has issued conveying a fee in the land, subject to a lie

of the United States, superior to all others, for future installments of water charges, is subject to State taxation.

A State may tax public land when the United States has, by final certificate, parted with the equitable title to a person subject to State taxation, and retains only the legal title by its delay in issuing the patent, but not until the equitable title passes can the State tax the entryman, except in the case of mining claims, and in cases in which express authority to tax is given by statute.

For purposes of State taxation the interest which an entryman has in land in a Federal irrigation project is not put in the same category as a mining claim by the provisions of the assignment act of June 23, 1910 (36 Stat. 592). The evident and sole purpose of this statute was to enable an entryman whose entry was cut down in area by the Secretary of the Interior in prescribing farm units, to dispose of his surplus to another who would be able to hold it, fulfill conditions, and secure a patent, and avoid a relinquishment or cancellation of the surplus, which had been the consequence before the act.

A homestead entryman on land within the Salt River Federal irrigation project in Arizona does not, upon fulfilling all the requirements of the original homestead act of May 20, 1862 (12 Stat. 392), acquire an equitable title from the United States taxable by Arizona, where a number of important steps remain to be taken by such entryman in proving his claim under the reclamation act of June 17, 1902. Such interest is not taxable until final certificate has issued.

*Condemnation of land for town site.*—The reservoir proposed by the Reclamation Service to be constructed at American Falls, Idaho, as an extension of the Minidoka Federal irrigation project would necessarily flood a portion of the present town site of American Falls, and without the power to acquire and improve a new town site it would be difficult, if not impossible, to acquire rights with respect to public streets, structures, and buildings in the area to be flooded essential to the carrying out of the project. For the purpose of providing for a new town site the United States brought suit in eminent domain to acquire title in fee to 120 acres of land, the property of De Witt G. Brown, under authority of a special provision in the appropriation act of March 4, 1921 (41 Stat. 1403). The defendant contested the suit upon the ground that the United States was without constitutional right to condemn the land in question for town-site purposes. In *United States v. Brown et al.* (279 F. 168), United States District Judge Dietrich held that the necessity of taking land by condemnation for public purposes is a legislative question, and when the taking is to be by the Government itself an act authorizing it is presumed to be within the constitutional power of Congress, and that the said act of March 4, 1921, is valid and authorizes such condemnation.

*Land patents to incapacitated ex-service men.*—The act of March 1, 1921 (41 Stat. 1202), providing for issuance of patents to incapacitated ex-service men, is an amendment of the homestead law but does not abrogate the provisions of the reclamation law regarding reclamation of one-half of the irrigable area and payment of water charges. These two laws are separate and distinct. The act of March 1, 1921, does not require patent to issue for lands under Federal irrigation projects before submission of final affidavit approved by the project manager, showing reclamation of one-half the irrigable area of the entry and payment of all fees, commissions, and water charges to date of such approval. (Departmental decision, re Claude E. Barber, Belle Fourche project, August 3, 1921.)

### RECLAMATION FUND.

*Payment of cost of measuring and apportioning waters of St. Mary and Milk Rivers.*—Officers and employees of the Reclamation Service detailed to act temporarily under the supervision of the International Joint Commission, to measure and apportion the waters of St. Mary River and Milk River in accordance with the treaty of May 13, 1910 (36 Stat. 451), with Great Britain, should be paid their compensation or salaries from the reclamation fund. If, however, there are expenses incurred by such officers and employees solely because of their work with the commission, such expenses may properly be paid from the appropriation for the support of the commission. (Comp. Dec., April 15, 1921.)

*Yuma Mesa auxiliary reclamation fund.*—Under the act of January 25, 1917 (39 Stat. 863), as amended by the act of February 11, 1918 (40 Stat. 437), moneys received from the sale of public lands under the Yuma Mesa auxiliary project, in Arizona, may be utilized for the construction of the irrigation works of said project, but reimbursement therefor must be made by the landowners to the auxiliary reclamation fund. Congress failed to make provision for the final disposition of these moneys and they must remain in said auxiliary reclamation fund after repayment, subject to such disposition as Congress may in the future make. (Comp. Dec., May 10, 1921, and July 6, 1921.)

## RESERVOIRS.

*Horseshoe Reservoir.*—The Verde Water & Power Co. claimed an easement in what is known as the Horseshoe Reservoir site in Arizona, under section 2399 of the Revised Statutes of the United States and paragraphs 5337 and 5338, Revised Statutes of Arizona, 1913. This claim was based upon a number of notices of appropriation of the reservoir site and the waters of the Verde River, the first of which was posted August 5, 1901. The company claimed to have expended about \$600,000 in the enterprise. On July 27, 1903, the Secretary of the Interior withdrew in connection with the Salt River Federal irrigation project the public lands embracing this site under the first form of withdrawal authorized by section 3 of the act of June 17, 1902 (32 Stat. 388). The Salt River Valley Water Users Association claimed an interest in the site and brought suit against the company to quiet title. The Supreme Court of Arizona decided in favor of the water users association, holding that the withdrawal revoked any permit or license the company had. (*Verde Water & Power Co. v. Salt River Valley Water Users Association et al.*, 197 P. 227; 66 L. ed. 64.)

## WATER CHARGES.

*Boise project suit.*—The suit brought April 1, 1918, by the Payette-Boise Water Users Association to secure a reduction of construction charges on the Boise project in Idaho (263 F. 734; 269 F. 159), was settled between the parties by contract dated July 12, 1921, which contract was incorporated in a final decree dated July 28, 1921. Briefly, this contract provides for the sale to project lands of 50,000 additional acre-feet of water from Arrowrock Reservoir and for the expenditure by the United States of from \$200,000 to \$225,000 for supplemental construction work upon approval thereof by a majority of water-right applicants and entrymen, gives to project lands temporary use of 26,000 acre-feet of water from Arrowrock Reservoir until completion of the supplemental construction work, provides that the cost of future drainage work shall be assessed as an operation and maintenance cost payable in advance, and adopts a tentative construction charge of \$77.44, such charge to be readjusted every 5 years for 20 years. The contract sustains the right of the Government to collect the actual cost of construction and amounts to an approval of the validity of contracts between the Government and the Nampa and Meridian, Pioneer, and Riverside irrigation districts.

*Yuma project suit.*—The suit brought by the Yuma County Water Users Association to reduce construction charges for the Yuma Valley division of the Yuma project in Arizona resulted in a judgment of dismissal in the trial court on February 26, 1920. From this decision the association appealed to the circuit court of appeals and on November 7, 1921, that court affirmed the decision of the trial court (275 F. 885).

*Construction of contract.*—Under a contract by which the Government took over the canal system of an irrigation company for the purpose of incorporating it in a larger Government project and providing that "an equitable proportion of the cost of maintaining and operating the system of irrigation works which may be constructed by the United States on the south side of the Boise Valley, as may be determined by the Secretary of the Interior, shall be paid to the United States by the holders of said certificates of stock," the fact that during the construction of the Government project the manager made charges for water furnished such stockholders on a different basis, held not to affect the right and duty of the Secretary, after completion of the project, to make the apportionment as expressly provided in the contract. Where the meaning of an instrument is clear, error in its construction by the parties can not control its effect. (*New York Canal Co., Limited, v. Bond et al.*, 273 F. 825.)

*Penalties.*—The Flathead Indian Federal irrigation project in Montana is not a reclamation project as contemplated by the act of June 17, 1902 (32 Stat. 388), and amendments thereto, and is not subject to the provisions of the act of August 13, 1914 (38 Stat. 686). In providing for partial reimbursement of construction costs under the Indian appropriation act of February 14, 1920 (41 Stat. 409), the Secretary of the Interior is without authority to require payment of a penalty by either Indians or white settlers in case of a delinquency in payment. (Opinion Solicitor for the Department of the Interior, November 15, 1921.)

*Extension of charges.*—The relief act of March 31, 1922 (Public No. 185, 42 Stat. —), authorizes the Secretary in his discretion to make certain extensions of construction charges and to deliver water in 1922 to those delinquent for more than one calendar year. Departmental interpretations of this act are contained in C. L.'s 1100, 1120, 1132, and 1139.

## WATER RIGHTS.

*Seepage waters in Idaho.*—In *United States v. Haga* (276 F. 41), the United States District Court for the Southern District of Idaho sustains the right of the Government to utilize waste and seepage waters developed under a Federal irrigation project.

*Seepage waters in Wyoming.*—The United States can save and continue to use the drainage, seepage, and waste waters from a Federal irrigation project even after such waters have been allowed to escape, so long as they can be identified and have not been abandoned. Even if waste water from a Government project has once been abandoned, the Government can thereafter reclaim such water and apply it to beneficial use if no right of third parties has intervened. (*United States v. Ide, et al.*, 277 F. 373.)

*Authority of Washington State Engineer.*—The State Hydraulic Engineer of Washington has authority to issue or enforce an order that an irrigation company take no more waters from a river than the amount provided for in a limiting agreement entered into by it and approved by the Federal courts. The hydraulic engineer in so doing does not act in a judicial capacity nor is he strictly enforcing the decree of a Federal court, but is merely enforcing a right which the Federal court has determined to exist. (*West Side Irrigating Co. v. Chase*, 196 P. 666; see 192 P. 892; 230 F. 284; 246 F. 212; 264 F. 538.)

*Decision of International Joint Commission.*—On October 4, 1921, at Ottawa, Canada, the International Joint Commission handed down a unanimous decision interpreting Article VI of the treaty of January 11, 1909 (36 Stat. 2451), between the United States and Great Britain, relative to the measurement and apportionment of the waters of the St. Mary and Milk Rivers and their tributaries in the State of Montana and the Provinces of Alberta and Saskatchewan. The questions involved affect the water supply of the Milk River Federal irrigation project in Montana, and were argued before the commission at St. Paul, Minn., in 1915, at Detroit, Mich., in 1917, and at Ottawa, Canada, in 1920. The text of the decision appears in the November, 1921, issue of the *Reclamation Record*, at page 515.

## WATER USERS' ASSOCIATIONS.

*Personal liability.*—Neither the articles of incorporation nor the by-laws of the Payette-Boise Water Users' Association (Boise Federal irrigation project, Idaho) nor the stock subscription contracts made by its members, contains an agreement to pay assessments, and therefore there is no personal liability on the part of the members to make such payments. (Opinion State District Judge B. S. Varian, October 11, 1921, in *Payette-Boise Water Users' Association v. Mercer*, citing *Wall v. Basin Mining Co.*, 16 Idaho, 328; 101 Pac. 733.)

*Application of State law.*—The provisions of the articles of incorporation and by-laws of the Payette-Boise Water Users' Association (Boise Federal irrigation project, Idaho) and of the stock subscription contracts made by its members, are merely declaratory of State law, and the direction of the latter must be followed in order to enforce the lien of an assessment made against a member. (Opinion State District Judge B. S. Varian, October 19, 1921, in *Payette-Boise Water Users' Association v. Griffiths*.)

*Foreclosure of lien.*—The Payette-Boise Water Users' Association brought suit against Sherman D. Fairchild, one of its members, to secure personal judgment for the amount of an assessment levied by the association. Fairchild contended that under his subscription contract for shares in the association, a lien to secure assessments was created, which lien could be enforced only by foreclosure and sale as in the case of mortgages, and that the association in an action to force collection of the assessment could not segregate from the contract the simple promise to pay such assessments and sue on the contract for a personal judgment without foreclosure. The defendant obtained judgment in the trial court which was sustained by the Supreme Court of Idaho, in *Payette-Boise Water Users' Association (Ltd.) v. Fairchild*, 205 P. 258.



# ENGINEERING DATA FOR PROJECTS ON COMPLETION.

[The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams, and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canal, they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress.]

## Engineering data for projects when completed.

### RESERVOIRS.

Projects.	Name.	Area.	Capacity.	Spillways.			
				Length.	Elevation above stream bed.	Capacity.	
						Normal.	Maximum.
		<i>Acres.</i>	<i>Acres-feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Arizona: Salt River.....	Roosevelt.....	16,832	1,305,000	420	225		
California: Orland.....	East Park.....	1,850	51,000	415	88	8,000	12,000
Colorado: Uncompahgre	Taylor Park.....	2,260	106,000	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Idaho:							
Boise.....	Deer Flat.....	9,835	177,000	None.			
Do.....	Arrowrock.....	2,860	280,000	402	247	15,000	40,000
Minidoka.....	Lake Walcott.....	11,350	* 150,000	2,385	42	40,000	60,000
Do.....	Jackson Lake.....	25,530	847,000	160	41	7,500	13,000
Montana:							
Milk River.....	St. Mary Lakes.....	6,910	124,000	500	20	* 500	20,000
Do.....	Sherburne Lakes.....	2,000	78,000	200	70	* 200	8,000
Do.....	Nelson Reservoir.....	4,560	66,800	( <sup>1</sup> )	* 23		
Do.....	Point of Rocks.....	180	830	740	8	* 0	700
Do.....	Beaver Creek.....	5,800	50,000	238	39	* 100	15,000
Do.....	Chain Lakes.....	9,400	244,000	300	58	* 300	10,000
Sun River.....	Willow Creek.....	2,696	86,000	200	100	725	( <sup>1</sup> )
Do.....	Beaver Creek.....	1,360	105,000	275	190		42,500
Do.....	Fishkum Reservoir.....	1,542	45,700	Under	control.		
Do.....	Muddy Creek.....	1,828	33,000		80	284	( <sup>1</sup> )
Do.....	Benton Lake.....	9,300	144,000	Under	control.		
Nebraska - Wyoming:							
North Platte.....	Pathfinder.....	22,700	1,070,000	605	184	40,000	
Do.....	Lake Alice.....	900	11,400	100	18	2,500	
Do.....	Lake Minatare.....	2,240	60,780	100	55	2,000	
Do.....	Winters Creek Lake.....	360	3,000	None.			
Do.....	Guernsey.....	2,336	72,700	300	80	27,500	50,000
Nevada: Newlands.....	Lake Tahoe.....	120,000	120,000	85	6		
Do.....	Lahontan.....	12,000	290,000	500	112		30,000
Do.....	Spanish Springs.....	17,700	300,000	60	90		1,600
New Mexico: Carlsbad.....	Avalon.....	970	7,000	1,026	21	86,000	
Do.....	McMillan.....	7,860	45,000	1,750	26.1-24.9	17,000	34,500
New Mexico-Texas: Rio Grande.	Elephant Butte.....	40,080	2,638,000	275	193	8,000	16,000
Oregon: Umatilla.....	Cold Springs.....	1,500	50,000	330	90	6,000	6,000
Do.....	McKay.....	1,600	75,000	120	140	10,000	10,000
Oregon-California: Klamath.	Upper Klamath Lake.....	60,000	264,000	None.			
Do.....	Clear Lake.....	25,000	462,000	357	24	10,000	30,000
South Dakota: Belle Fourche.	Belle Fourche.....	8,010	203,000	314	100	2,000	2,000
Do.....	Nine Mile.....	150	2,500	20	20	( <sup>1</sup> )	( <sup>1</sup> )
Utah: Strawberry Valley	Strawberry Valley.....	8,370	250,000	58	61	500	2,000
Washington:							
Okanogan.....	Salmon Lake.....	240	10,500	Siphon.	42		400
Do.....	Conconully.....	460	14,400	180	55	4,500	16,000
Yakima.....	Bumping Lake.....	1,350	34,000	235	36		6,000
Do.....	Lake Clealum.....	4,680	501,000	420	112		18,000
Do.....	Lake Kachess.....	4,800	210,000	250	53		7,200
Do.....	Tieton.....	2,500	202,500	390	206		50,000
Do.....	Lake Keechelus.....	2,550	152,000	300	60		10,000
Do.....	Clear Creek.....	126	1,700	210	35		
Wyoming: Riverton.....	Pilot Butte.....	882	30,000			500	500
Do.....	Bull Lake.....	3,100	145,000		67		
Shoshone.....	Shoshone.....	6,600	456,600	300	233	11,000	30,000
Do.....	Ralston.....	200	2,100				
Do.....	Deaver.....	80	680	None.			

<sup>1</sup> Undetermined.

\* 95,180 acre-feet only available; above fixed crest of spillway.

\* Average flow of stream on which reservoir is located.

\* No spillways; drainage limited; elevation is that of water surface.

\* Tentative.

*Engineering data for projects when completed—Continued.*

## RESERVOIRS—Continued.

Projects.	Name.	Area.	Capacity.	Spillways.			
				Length.	Elevation above stream bed.	Capacity.	
						Normal.	Maximum.
INDIAN PROJECTS.							
Montana:		<i>Acres.</i>	<i>Acre-feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Blackfoot.....	Two Medicine Lake..	854	16,000	66	25½	350	6,000
Do.....	Spring Lake.....	1,670	29,000	.....	35	.....	.....
Do.....	Four Horns.....	1,130	30,000	.....	45	.....	.....
Do.....	Guardipee.....	1,260	30,000	.....	40	.....	.....
Flathead.....	Dog Lake.....	160	3,200	.....	30	.....	.....
Do.....	Dry Fork.....	330	3,400	250	28	500	1,500
Do.....	Flathead Lake.....	120,000	1,800,000	1,000	180	100,000	150,000
Do.....	Horte.....	73	280	40	17	140	300
Do.....	Hubbart.....	400	12,000	265	95	5,000	5,000
Do.....	Kickinghorse.....	675	6,800	.....	23	.....	.....
Do.....	Little Bitterroot Lake	3,000	18,000	.....	3	.....	.....
Do.....	Lower Crow Creek.....	300	9,485	100	82	600	1,500
Do.....	McDonald Lake.....	220	10,600	100	51	4,000	6,000
Do.....	Mission.....	300	8,300	100	74	1,200	3,000
Do.....	Ninepipe.....	1,630	15,100	.....	30	.....	.....
Do.....	Pablo.....	2,100	29,600	.....	36	.....	.....
Do.....	Polson.....	70	1,700	.....	80	.....	.....
Do.....	Tabor.....	300	22,000	50	42	400	1,200
Do.....	Twin.....	70	937	.....	25	.....	.....
Fort Peck.....	Little Porcupine.....	580	3,900	.....	.....	.....	.....
Do.....	Big Porcupine.....	400	3,800	100	.....	.....	.....
Do.....	Poplar River.....	3,700	50,000	(1)	.....	.....	.....
Do.....	Wolf Creek.....	350	4,550	(1)	.....	.....	.....
Do.....	Smoke Creek.....	300	5,300	(1)	.....	.....	.....
Total.....		615,119	13,692,102	.....	.....	.....	.....

## STORAGE DAMS.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Arizona: Salt River.....	Roosevelt <sup>1</sup> .....	Rubble masonry arch, gravity.	280	1,125	342,325
California: Orland.....	East Park <sup>2</sup> .....	Concrete arch, gravity.....	139	250	12,200
Colorado: Umcom-pahgre.....	Taylor Park.....	Undetermined.....	(12)	(12)	(12)
Idaho:					
Boise.....	Upper Deer Flat <sup>3</sup> .....	Earth fill.....	70	4,000	1,190,275
Do.....	Lower Deer Flat <sup>3</sup> .....	do.....	40	7,200	1,207,606
Do.....	Deer Flat Forest <sup>3</sup> .....	do.....	16	950	22,500
Do.....	Arrowrock <sup>3</sup> .....	Rubble concrete arch, gravity.	349	1,100	585,130
Minidoka.....	Minidoka <sup>4</sup> .....	Rock fill, concrete core.....	86	937	242,500
Do.....	Jackson Lake <sup>4</sup> .....	Massive concrete gate section and earth fill.	67	4,450	345,400
Montana:					
Milk River.....	St. Marys Lake.....	Earth embankment.....	30	2,000	135,000
Do.....	Sherburne Lakes <sup>14</sup> .....	do.....	78	2,000	215,000
Do.....	Nelson Reservoir <sup>15</sup> .....	do.....	28	9,900	175,000
Do.....	Point of Rocks <sup>5</sup> .....	do.....	12.5	2,680	31,000
Do.....	Beaver Creek.....	do.....	49	6,000	658,000
Do.....	Connolly.....	do.....	70	3,125	1,795,600
Sun River.....	Willow Creek <sup>16</sup> .....	Earth fill.....	110	1,045	452,000
Do.....	Beaver Creek <sup>5</sup> .....	Masonry.....	205	820	195,000
Do.....	Pishkun.....	Earth fill.....	48	8,600	444,000
Do.....	Muddy Creek.....	do.....	90	800	440,000
Do.....	Benton Lake.....	do.....	40	240	12,000

<sup>1</sup> Undetermined<sup>2</sup> Average flow of stream on which reservoir is located.<sup>3</sup> No spillways; drainage limited; elevation is that of water surface.<sup>4</sup> Tentative.<sup>5</sup> Elevation above outlet.<sup>6</sup> Present capacity 2,000 acre-feet.<sup>7</sup> Completed.<sup>8</sup> Present capacity, 8,200 acre-feet.<sup>9</sup> Present capacity, 5,500 acre-feet.<sup>10</sup> Present capacity, 12,000 acre-feet.<sup>11</sup> Present capacity, that of natural lake 12,300.<sup>12</sup> Not designed.<sup>13</sup> First development completed.<sup>14</sup> Completed except a small amount of gravel blanket.<sup>15</sup> Completed to height of 70 feet.

*Engineering data for projects when completed—Continued.*

## STORAGE DAMS—Continued.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Nebraska-Wyoming:	Pathfinder <sup>a</sup> .....	Broken range masonry arch.	218	432	60,210
North Platte.					
Do.	Pathfinder Dike <sup>a</sup> .....	Earth fill.	40	1,650	152,000
Do.	Dam No. 1 <sup>a</sup> .....	do.	30	3,100	240,000
Do.	Dam No. 1½ <sup>a</sup> .....	do.	23	2,550	119,000
Do.	Minatare <sup>a</sup> .....	do.	65	3,700	570,000
Nevada: Newlands.	Lake Tahoe <sup>a</sup> .....	Concrete sluiceway regulator.	14	1,109	425
Do.	Lahontan <sup>a</sup> .....	Earth and gravel fill with concrete spillways.	124	1,400	770,000
Do.	Spanish Springs.....	do.	112	2,815	.....
New Mexico:					
Carlsbad.	Avalon <sup>a</sup> .....	Earth and rock fill, concrete core.	50	1,380	168,773
Do.	McMillan <sup>a</sup> .....	Earth and rock fill.	55	2,070	150,744
New Mexico-Texas:	Elephant Butte <sup>a</sup> .....	Rubble concrete, gravity.	306	1,155	605,200
Rio Grande.					
Do.	Elephant Butte Dike <sup>a</sup> .....	Earth and rock fill.	42	2,000	179,000
Oregon: Umatilla.	Cold Springs <sup>a</sup> .....	do.	98	3,800	789,500
Oregon-California:	Clear Lake <sup>a</sup> .....	Rock fill.	33	790	56,600
Klamath.					
Do.	Link River.....	Concrete.	22	435	2,200
South Dakota: Belle Fourche.	Belle Fourche <sup>a</sup> .....	Earth fill.	115	6,200	1,600,000
Do.	Nine Mile.....	do.	28	1,400	50,800
Utah: Strawberry Valley.	Indian Creek Dike <sup>a</sup> .....	Earth fill, reinforced concrete.	37	1,311	101,107
Do.	Strawberry Dam <sup>a</sup> .....	Earth fill, reinforced concrete core wall.	72	488	108,415
Washington:					
Okanogan.	Salmon Lake.....	Earth embankment.	40	1,260	180,211
Do.	Conconully.....	Hydraulic earth fill.	64	1,000	354,242
Yakima.	Bumping Lake <sup>a</sup> .....	Earth fill.	45	3,425	247,700
Do.	Lake Cle Elum.....	Earth and gravel fill.	125	700	462,000
Do.	Lake Kachess <sup>a</sup> .....	do.	63	1,400	193,300
Do.	Tieton.....	Earth and rock fill, concrete core wall.	321	905	1,850,000
Do.	Lake Keechelus <sup>a</sup> .....	Earth and gravel fill.	70	6,500	639,000
Do.	Clear Creek <sup>a</sup> .....	Single concrete arch.	84	404	4,100
Wyoming: Riverton.	Pilot Butte.....	Earth embankment.	40	3,000	.....
Do.	Bull Lake.....	do.	77	3,200	.....
Shoshone.	Shoshone <sup>a</sup> .....	Rubble concrete arch.	328	200	78,576
Do.	Ralston <sup>a</sup> .....	Earth fill.	50	150	24,740
Do.	Deaver.....	do.	14	1,300	30,300
INDIAN PROJECTS.					
Montana:					
Blackfeet.	Two Medicine <sup>10</sup> .....	Earth embankment.	36	900	28,600
Do.	Spring Lake.....	do.	45	1,625	158,000
Do.	Four Horns <sup>10</sup> .....	do.	58	1,650	46,000
Do.	Guardipee.....	do.	50	613	35,000
Flathead.	Dog Lake.....	Loose rock and earth.	35	2,250	67,000
Do.	Dry Fork <sup>11</sup> .....	Earth.	33	3,250	118,500
Do.	Newell.....	Concrete.	170	850	100,000
Do.	Horte <sup>a</sup> .....	Earth fill.	16	930	3,800
Do.	Hubbart.....	Concrete.	104	500	16,000
Do.	Kickinghorse.....	Earth.	31	3,700	181,000
Do.	Little Bitterroot <sup>a</sup> .....	do.	10	800	10,000
Do.	Lower Crow Creek.....	do.	92	960	330,000
Do.	McDonald Lake <sup>11</sup> .....	Loose rock and earth.	57	1,500	214,000
Do.	Mission.....	do.	80	2,500	346,000
Do.	Ninepipe <sup>11</sup> .....	Earth.	38	2,180	162,000
Do.	Pablo <sup>11</sup> .....	do.	46	14,000	1,028,000
Do.	Polson.....	do.	85	1,100	170,000
Do.	Tabor.....	Loose rock and earth.	58	2,200	140,000
Do.	Twin.....	Earth.	30	1,600	46,000
Fort Peck.	Little Porcupine <sup>a</sup> .....	Earth fill.	17	4,200	43,400
Do.	Big Porcupine.....	do.	30	1,500	118,000
Do.	Poplar River.....	do.	51	5,200	1,500,000
Do.	Wolf Creek.....	do.	36	.....	85,300
Do.	Smoke Creek.....	do.	48	.....	76,000
Total.....					23,318,279

<sup>a</sup> Completed.<sup>10</sup> Including spillway and approaches, 1,675 feet.<sup>11</sup> Including spillway, 619,000 cubic yards.<sup>12</sup> Completed, except automatic crest.<sup>13</sup> Completed for 4,000 acre-feet.<sup>14</sup> First development completed; 83,500 cubic yards.<sup>15</sup> First development completed; 114,000 cubic yards; 8,200 acre-feet.<sup>16</sup> First development, 64,191; completed for 5,000 acre-feet.<sup>17</sup> First development, 153,750; completed for 13,000 acre-feet.

*Engineering data for projects when completed—Continued.*

## DIVERSION DAMS.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Arizona: Salt River..	Granite Reef <sup>a</sup> .....	Rubble concrete weir.....	38	1,000	40,000
Do.....	Power Canal <sup>a</sup> .....	do.....	12½	400	4,800
Do.....	Joint Head <sup>a</sup> .....	Concrete weir.....	10	600	1,740
Arizona - California:	Laguna <sup>a</sup> .....	Indian weir, concrete and rock fill. <sup>7½</sup>	10	4,780	441,732
Yuma.					
California: Orland..	South Canal <sup>a</sup> .....	Concrete on piling, with rock fill.	20	900	2,886
Do.....	North side <sup>a</sup> .....	Concrete weir, with removable timber crest.	8	360	270
Do.....	East Park Feed Canal <sup>a</sup>	Concrete arch.....	44	154	1,777
Colorado:					
Grand Valley.....	Colorado River Diversion. <sup>a</sup>	Masonry ogee weir with roller crest 10 to 15 feet high.	24	546	25,682
Uncompahgre.....	Gunnison <sup>a</sup> .....	Crib on rock fill and movable flashboards.	16½	237	3,200
Do.....	Montrose and Delta <sup>a</sup> .....	Movable flashboard weir.....	6.8	68½	.....
Do.....	Loutsenhizer <sup>a</sup> .....	Pile and timber weir.....	.....	100	.....
Do.....	Selig <sup>a</sup> .....	Movable flashboard weir.....	6	95½	.....
Do.....	Ironstone <sup>a</sup> .....	Pile foundation with deck and needle flashboards.	8½	58½	.....
Do.....	East Canal <sup>a</sup> .....	Movable flashboard weir.....	(?)	144	.....
Do.....	Garnet <sup>a</sup> .....	Rubble concrete.....	.....	.....	.....
Idaho:					
Boise.....	Boise River <sup>a</sup> .....	Rubble concrete weir.....	45	246	21,750
Do.....	Black Canyon.	Concrete masonry.....	153	1,075	74,500
Minidoka.....	Minidoka <sup>a</sup> .....	Combined diversion and storage dam. (See Storage.)	.....	.....	.....
Montana:					
Milk River.....	Swift Current <sup>a</sup> .....	Earth and timber crib.....	12	2,800	86,700
Do.....	St. Mary <sup>a</sup> .....	Concrete.....	6.5	198	480
Do.....	Chinook <sup>a</sup> .....	.....	.....	.....	.....
Do.....	Dodson <sup>a</sup> .....	Timber crib, rock filled, concrete abutments, movable crest.	25	319	12,000
Do.....	Vandalia <sup>a</sup> .....	Reinforced concrete, automatic movable crest.	34	1,500	11,000
Sun River.....	Sun River <sup>a</sup> .....	Concrete masonry.....	132	212	6,200
Do.....	Deep Creek.....	Reinforced concrete.....	12	100	500
Montana-North Dakota: Lower Yellowstone.	Lower Yellowstone <sup>a</sup> ..	Rock-filled, timber weir.....	12	700	14,500
Nebraska-Wyoming: North Platte.					
Nevada: Newlands..	Truckee River <sup>a</sup> .....	16 concrete sluiceways.....	22	171	3,322
Do.....	Carson River <sup>a</sup> .....	23 concrete sluiceways.....	21	240	2,707
New Mexico: Carlsbad.	Avalon <sup>a</sup> .....	Combined storage and diversion. (See Storage.)	.....	.....	.....
New Mexico-Texas: Rio Grande.	Leasburg <sup>a</sup> .....	Rubble concrete weir.....	10.8	600	2,413
Do.....	Mesilla <sup>a</sup> .....	do.....	16.7	303	2,576
Do.....	Mexican <sup>a</sup> .....	Rubble masonry.....	4.7	320	.....
Do.....	Percha <sup>a</sup> .....	Rubble concrete.....	17	350	4,346
Oregon: Umatilla..	Feed Canal (Echo) <sup>a</sup> .....	Concrete weir on timber crib.	2½	400	298
Do.....	Maxwell Canal <sup>a</sup> .....	do.....	2.3	175	43
Do.....	Three-Mile Falls <sup>a</sup> .....	Concrete multiple arch.....	24	800	4,180
Oregon - California: Klamath.	Lost River <sup>a</sup> .....	Hollow reinforced concrete.....	40	290	5,550
Do.....	Lower Lost River <sup>19</sup>	Reinforced concrete.....	15	204	626
Do.....	Langell Valley.....	Earth, with concrete spillway.	30	515	17,415
South Dakota: Belle Fourche.	Diversion <sup>a</sup> .....	Concrete weir.....	23	400	12,149
Utah: Strawberry Valley.	Spanish Fork <sup>a</sup> .....	do.....	16	70	1,262
Do.....	Indian Creek Crossing <sup>a</sup> .....	Earth.....	17	1,300	15,183
Do.....	Horse Creek Crossing <sup>a</sup> .....	do.....	6	500	7,376
Do.....	Diverting dam at Strawberry Dam. <sup>a</sup>	do.....	6	100	1,146
Do.....	Diverting dam at rating flume. <sup>a</sup>	do.....	12	150	4,103

<sup>a</sup> Completed.<sup>b</sup> Under construction.<sup>c</sup> Maximum height 40 feet from bottom of sheet piling to top of dam; water raised 10 feet.<sup>d</sup> Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.<sup>e</sup> Length including logway.<sup>f</sup> Will be constructed by irrigation districts. No data available as to type and dimensions.<sup>g</sup> Constructed by Mexican authorities and used jointly.

*Engineering data for projects when completed—Continued.*

## DIVERSION DAMS—Continued.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
Washington:			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Okanogan.....	Salmon Creek <sup>1</sup> .....	Concrete weir.....	4½	50	132
Yakima.....	Sunnyside <sup>2</sup> .....	Concrete ogee weir.....	8½	500	2,291
Do.....	Tieton Diversion <sup>3</sup> .....	Concrete and rock-filled crib.....	3	110	334
Wyoming:					
Riverton.....	Wind River <sup>10</sup> .....	Concrete weir.....	27	625	17,000
Shoshone.....	Corbett <sup>1</sup> .....	Reinforced concrete weir.....	18	400	4,951
Do.....	Willwood.....	Concrete gravity, with ogee weir section.....	68	320	18,500
INDIAN PROJECTS.					
Montana:					
Blackfeet.....	Two Medicine.....	Brush and rock.....	4	165	175
Do.....	Blacktail <sup>1</sup> .....	Concrete.....	14	54	290
Do.....	Badger Birch and Cut Bank.....	Not yet designed.....			
Flathead.....	Jocko River.....	Log crib, rock filled <sup>11</sup> .....			
Do.....	Little Bitterroot.....	do.....			
Do.....	Camas A <sup>1</sup> .....	Arched masonry.....	25	125	500
Do.....	Mud Creek <sup>1</sup> .....	Concrete.....	12	18	116
Do.....	Crow Creek <sup>1</sup> .....	do.....	18	82	330
Do.....	Post Creek—Kicking-horse <sup>1</sup> .....	Log crib, rock filled.....	7	110	1,500
Do.....	Post Creek—Pablo Feeder.....	Concrete <sup>12</sup> .....			
Do.....	Mission Creek <sup>1</sup> —B Lateral.....	Log apron.....	3	80	
Do.....	Dry Creek <sup>1</sup> .....	Log crib, rock filled <sup>13</sup> .....	10	20.67	115
Do.....	Finley Creek.....	do.....			
Do.....	Agency Creek.....	Concrete.....			
Do.....	Big Knife Creek <sup>1</sup> .....	do.....	5	6	25
Do.....	Valley Creek.....	Log crib, rock filled <sup>14</sup> .....			
Do.....	Other small creeks.....	do.....			
Fort Peck.....	Little Porcupine <sup>1</sup> .....	Concrete weir on timber crib.....	4	150	250
Do.....	Poplar River <sup>1</sup> .....	do.....	4	300	180
Do.....	Big Porcupine <sup>1</sup> .....	do.....	6	150	185
Do.....	Big Muddy.....	Concrete.....	17	72	340
Total.....					962,142

## IRRIGABLE AREA, PRESENT STATUS.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	With-drawn.			Rail-road, unsold.	Other.	
Arizona:	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Salt River.....	16,170					196,830		213,000
Gravity system.....						183,077		183,077
Pumping system.....	16,170					13,753		29,923
Arizona-California: Yuma.....	18,060	286	33,284		8,200	50,170		110,000
Arizona—								
Valley.....	6,070		1,000			42,930		50,000
Mesa.....	5,790	286	31,884			7,040		45,000
California—Reservation.....	6,200		400		8,200	200		15,000
California:								
Orland—Main.....						120,657		120,657
Colorado:								
Grand Valley.....	13,442	402	12,310			28,845		55,000
Garfield gravity.....	10,912	403	8,280			15,405		35,000
Garfield pumping.....	2,530		4,030			3,440		10,000
Orchard Mesa pumping.....						10,000		10,000
Uncompahgre.....	19,687	1,094	799			75,830		97,410
South Canal system.....	2,330	306	32			6,339		9,007
West Canal system.....	2,286	10	12			4,033		6,341
Montrose and Delta Canal system.....	5,376	70	31			23,257		28,734
Loutsenhizer Canal system.....	230					6,463		6,693
Selig Canal system.....	4,286	350	610			7,433		12,668
Ironstone Canal system.....	1,203	65	20			16,752		18,040
East Canal system.....	3,968	284	94			8,877		13,223
Garnet Canal system.....	8					2,676		2,684

<sup>1</sup> Includes 320 acres of vested rights and 162 acres of town and school sites.<sup>2</sup> Completed.<sup>10</sup> Not designed.<sup>11</sup> Under construction.

*Engineering data for projects when completed—Continued.*

## IRRIGABLE AREA, PRESENT STATUS—Continued.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	Withdrawn.			Railroad, unsold.	Other.	
<b>Idaho:</b>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Boise.....	67,468		5,560	5,980			274,592	353,600
Arrowrock (Idaho).....	66,229			60			203,401	269,690
Arrowrock (Oregon).....	1,230						5,067	6,936
Notus.....							6,874	6,874
Hillcrest.....			2,230				11,870	14,100
Black Canyon.....			3,330	5,920			46,750	56,000
King Hill.....	518	119		370			15,971	16,978
Mindoka.....	96,357	343		28			24,829	121,557
Gravity.....								72,565
Pumping.....								48,962
<b>Montana:</b>								
Huntley.....	26,286		2,526				3,906	32,718
Gravity.....								27,181
Pumping.....								5,537
Divisions—								
Prior.....								28,463
Eastern.....								1,858
Fly Creek.....								2,397
Milk River.....	31,580		19,603	6,796			102,220	160,208
Chinook division.....	1,941		2,143	1,223			52,296	57,603
Malta division.....	23,316		16,956	4,369			34,833	79,474
Glasgow division.....	6,333		504	1,203			15,091	23,131
Sun River.....	42,900		39,000	9,500		249	78,061	169,700
Sun River Slope.....	700		12,900	1,100			2,300	17,000
Big Coulee.....				856			1,962	2,318
Greenfields.....	25,236		22,889	4,890			21,912	74,927
Mill Coulee.....	3,000		3,000	500			2,000	8,500
Fort Shaw.....	11,964		211	154		249	1,677	14,255
Great Falls.....				200			7,500	7,700
Vaughn.....				500			9,500	10,000
Benton.....	2,000			1,800			31,200	35,000
<b>Montana-North Dakota:</b>								
Lower Yellowstone.....	13,984		2,412	986		97	42,060	59,529
Montana.....	7,457		1,285	846		97	29,523	39,208
North Dakota.....	6,527		1,127	140			12,527	20,321
Divisions—								
Gravity.....	13,631		2,356	704		52	40,478	57,221
Pumping.....	353		56	282		45	1,572	2,308
<b>Nebraska-Wyoming: North</b>								
Platte.....	134,870		16,422	9,254			91,999	252,545
Interstate division.....	83,681		411	529			45,924	130,545
Nebraska.....	81,070		411	529			28,939	110,949
Wyoming.....	2,611						16,985	19,596
Fort Laramie division.....	44,699		15,511	7,325			39,475	107,000
Nebraska.....	8,550		7,200	4,000			32,100	51,850
Wyoming.....	36,139		8,311	3,325			7,375	55,150
Northport division, Nebraska.....	6,500		500	1,400			6,600	15,000
Nevada: Newlands.....	29,438	3,253	29,432		23,877	20,000	53,000	159,000
Carson division.....	25,378	3,253	7,852		4,877	2,500	39,140	83,000
Truckee division.....	4,060		2,060			2,000	13,860	22,000
Pyramid division.....			4,500		19,000	1,500		25,000
Lovelock division.....			15,000			14,000		29,000
<b>New Mexico: Carlsbad.....</b>	55						24,936	24,991
New Mexico-Texas Rio Grande.....	600	1,000	700	1,000			146,700	150,000
New Mexico.....	600	1,000	700	1,000			82,700	86,000
Texas.....							64,000	64,000
Divisions—								
Rincon.....		200		900			15,900	17,000
Leasburg.....	110	300	640				29,950	31,000
Mesilla.....	490	500	60	100			45,850	47,000
El Paso.....							55,000	55,000
<b>North Dakota:</b>								
North Dakota pumping.....	254	139		23			10,337	10,753
Oregon, Umatilla.....	5,360	97	2,376			3,319	17,148	28,300
East division.....	2,977	97				1,407	12,519	17,000
West division.....	2,353		2,376			1,912	4,629	11,300

\* Includes North Platte Canal and Colonization Company lands.

\* Three thousand acres to be allotted to about 600 Indians; remainder of land to be sold in accordance with act (33 Stat. 225).

*Engineering data for projects when completed—Continued.*

## IRRIGABLE AREA, PRESENT STATUS—Continued.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	With-drawn.			Rail-road, unsold.	Other.	
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Oregon-California: Klamath.....	2,748		27,300				110,882	140,880
Oregon.....	2,286		4,300				101,636	108,222
California.....	462		23,000				9,196	32,658
Divisions—								
Main.....								42,474
Tule Lake.....								24,200
Pumping.....								23,485
Langell Valley.....								25,000
Bonanza Springs.....								6,000
Lower Klamath Lake.....								19,771
South Dakota: Belle Fourche.....	37,427	117	6,973	301			51,982	96,800
Utah: Strawberry Valley.....	1,953						53,436	55,389
High Line.....	1,953						19,307	21,260
Lake Shore.....							2,487	2,487
Mapleton.....							4,000	4,000
Power Canal.....							110	110
Santaquin.....							1,500	1,500
Spanish Fork Canyon.....							2,355	2,355
Spanish Fork.....							11,677	11,677
Springville.....							6,000	6,000
Future Divisions.....							6,000	6,000
Washington:								
Okanogan.....	116						7,584	7,700
Gravity.....								6,525
Pumping.....								1,175
Yakima.....	7,358		13,688	5,939	241	21,729	291,083	339,987
Sunnyside.....	2,627			30	241		104,702	107,600
Tieton.....	2,048						29,948	32,000
Roza.....	120		1,523	2,067		11,310	43,330	58,350
Moxee.....	1,663		775	1,332		2,783	30,197	36,750
Kittitas.....			4,990	1,406		3,936	59,955	70,287
Kennewick.....	900		6,400	1,100		3,700	22,900	35,000
Wyoming:								
Riverton.....			69,000		1,000		30,000	100,000
Shoshone.....	64,630	1,395	176,470	7,795		987	7,723	259,000
Montana.....	88			4				92
Frannie division.....	88			4				92
Wyoming.....	64,542	1,395	176,470	7,791		987	7,723	258,908
Garland division.....	41,001	539	605	352			1,727	44,254
Frannie division.....	23,541	826	9,853	1,339		987	1,708	38,254
Willwood division.....			16,312	500			788	17,600
Heart Mount division.....								
Oregon Basin.....			33,100	3,200			2,500	38,800
Chapman Bench & Sand Coulee.....			86,600	2,400			1,000	90,000
Sand Coulee.....			30,000					30,000
INDIAN PROJECTS.								
Montana:								
Blackfeet.....					107,500			107,500
Cutbank North.....					9,000			9,000
Cutbank South.....					18,000			18,000
Two Medicine.....					44,000			44,000
Badger-Fisher.....					30,000			30,000
Plegan.....					3,000			3,000
Birch Creek.....					3,500			3,500
Flathead.....	43,008			862	34,289		46,341	124,500
Camas.....	8,576				337		1,587	10,500
Mission Valley.....	34,210			862	26,715		40,213	102,000
Jocko.....	222				7,237		4,541	12,000
Fort Peck.....	9,713	107	100	80	132,000		10,000	152,000
Little Porcupine.....					1,865		547	2,412
Poplar.....					21,300		2,700	24,000
Big Porcupine.....					2,600		1,400	4,000
Big Muddy.....					19,100		900	20,000
Missouri.....					79,535		4,053	88,588
Galpin Bottom pump-ing.....	9,713	107	100	80				10,000
Milk River pumping.....					7,600		400	8,000
Total, all projects.....	684,002	8,343	457,955	48,943	307,107	46,381	1,867,001	3,419,702
Per cent.....	20.0	0.2	13.4	1.4	9.0	1.4	54.6	100.0

\* Distribution estimated.

\* Unapproved.

# CROP STATISTICS.

Summary of crop reports on Government reclamation projects in 1921--acres (acres).<sup>1</sup>

State and project.	Cereals.				Other grain and seed.						Hay and forage.						Total.		
	Barley.	Corn, In- dian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flaxseed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.		Other forage.	Pasture.
Arizona: Salt River.....	15,880	2,908	6,377		12,888	36,068			24,519			24,519	47,355		5,842			27,070	80,267
Arizona-California: Yuma.....	2,145				560	2,705			9,525			23,090	20,550		355			4,200	25,105
California: Orland.....	948				141	1,089			1,939			1,939	5,612		641		84	4,247	10,584
Colorado:																			
Grand Valley.....		863	1,383		1,715	3,961						461	4,555		80	1,072	1,386		7,103
Uncompahgre.....	107	1,848	6,445	14	12,307	20,721	280	181					24,015	126	343	176	351	8,019	23,080
Idaho:																			
Boise.....	3,200	4,985	2,465	190	26,980	37,810	1,070	5,870		11		6,951	43,061	7,900	54	395		5,980	57,290
King Hill.....	39	140	55		181	415	106	3				109	3,560	16	175	34		4,497	4,232
Mindoka.....																			
Gravity division.....	795	934	3,004	166	11,733	16,632	182	1,897				2,079	26,992	1,928	102	169	37	3,759	32,897
Pumping division.....	571	48	1,310	14	11,014	12,957	274	863				1,167	15,868	311		27		1,461	17,697
Montana:																			
Huntley.....	247	375	1,630		5,469	7,721	31	100		80		131	5,538	32				16,952	22,622
Milk River.....	10	113	1,045		2,550	3,718	165					245	3,890		8,840	96		12,326	
Sun River.....																			
Fort Shaw division.....	126	48	461		1,126	1,761	92	84				176	5,446	35	128			869	6,478
Greenfields division.....	139		965		9,524	10,628	69			17		86	922	25	463			160	1,570
Montana-North Dakota: Lower Yellowstone.....					5,100	7,428		56		77		133	7,401	32	2,280	64	1,500	477	11,844
Nebraska:																			
Wyoming:																			
North Platte:																			
North Platte Canal & Colonization Co. lands.....	212	1,307	1,536	116	435	2,606							3,892		310			28	4,200
Interstate division.....	3,413	9,462	9,594	454	4,552	27,385	77	133				439	30,980		482	117	5	1,390	32,974
Fort Laramie division.....	10	857	2,362		6,557	8,786		10			229	10	1,353		362	5		77	1,797
Northport division.....	12	470	301		410	1,193							90						90
Nevada: Newlands.....	732		60		2,443	3,235							31,217		247			7,874	39,338
New Mexico: Carlsbad.....	2,209	671			586	3,466	1,161		284			1,445	7,170			79		978	8,227
New Mexico-Texas: Rio Grande.....	649	14,406	992	2	9,995	26,044	477		261			758	26,919		1,562	2,108	21	6,755	40,395
North Dakota: North Dakota pumping.....																			
Oregon: Umatilla.....	65	71	235		25	371						89	625	77	605	92		513	1,812
	34	116			45	220						89	9,824		155	63		519	10,560

<sup>1</sup> Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1920, to September, 1921.



Summary of crop reports on Government reclamation projects in 1921—areas (acres)—Continued.

State and project.	Cereals.					Other grain and seed.						Hay and forage.								
	Barley.	Corn, In- dian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flaxseed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.	Other forage.	Pasture.	Total.	
Oregon-California: Klamath.	973		1,998	410	3,205	6,588							16,375			747			8,860	25,972
South Dakota: Belle Fourche.	1,423	5,622	5,390		5,341	17,776				153		2,163	25,829			1,796	375		7,332	35,351
Utah: Strawberry Valley.	218	213	1,252		7,400	9,083		76				76	11,080	210		435	86	135	3,615	15,561
Washington:																				
Okanogan.																				
Yakima—																				
Sunnyside division.	453	4,177	337	102	4,970	10,039														
Tieton division.	635	724	352		2,442	4,153														
Wyoming:																				
Shoshone—	166	46	2,579	20	6,204	9,015		657				723	18,160	18		298			2,338	20,814
Garland division.	97	74	1,205	8	1,748	3,132		644		49	3	783	4,228	258		117	17		831	5,551
Frankie division.																				
Total.	33,574	52,506	55,427	1,511	156,621	299,639	19,571	10,804	36,546	376	243	67,542	460,523	10,998	26,345	5,426	4,119	122,418	631,829	
State and project.	Vegetables and truck.					Fruits and nuts.					Fruits and nuts.									
	Beans.	Onions.	Pota- toes, white.	Pota- toes, sweet.	Truck.	Total.	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.	Miscel- laneous.	Total.						
Arizona: Salt River.					7,943	9,947														
Arizona-California: Yuma.					513	513														
California: Orland.					272	272														
Colorado:																				
Grand Valley.			292		120	402	257													
Uncompahgre.	188	365	10,806		411	11,770	1,871	98	3	3										
Idaho:																				
Boise.																				
King Hill.	50	38	5,200	20	982	6,290	1,371	105	26	600										
Mindoka—			251		126	377	560													
Gravity division.																				
Pumping division.	22		3,533		608	4,163	356													
			6,663		342	7,065														

State and project.	Miscellaneous.				Duplicated areas.	Total cropped.	Irrigated, no crop.					Total irrigated.			
	Beets, sugar.	Cotton.	Cane.	Other.			Total.	Young alfalfa.	Young fruit.	Fall plowing.	Miscellaneous.		Duplicated.		
Montana: Huntley.....					185	139	324								
Milk River.....					35	35	71								
Sun River.....															
Fort Shaw division.....					217	54	271								
Greenfield division.....					79	91	170								
Montana-North Dakota: Lower Yellowstone.....					314	188	502								
Nebraska-Wyoming: North Platte.....															
North Platte Canal & Colonization Co. lands.....					1,034	44	1,078								
Interstate division.....					9,300	422	9,722								
Fort Laramie division.....					653	44	707								
Northport division.....					43	4	47								
Newlands.....					484	129	613								
Nevada: Newlands.....					11	11	11								
New Mexico: Carlsbad.....					671	3,753	5,350	242	80	454			82		898
New Mexico-Texas: Rio Grande.....					136	790	90	161							
North Dakota: North Dakota Pumping.....					81	80	161								
Oregon: Umatilla.....					83	195	278	614	88	9	13		41		715
Oregon-California: Klamath.....					96	66	162								
South Dakota: Belle Fourche.....					238	159	416								
Utah: Strawberry Valley.....					300	181	481	60	186	2			36		284
Washington: Okanogan.....					19	92	111	4,618	14	65	6		33		4,726
Yakima.....															
Sunnyside division.....					7,032	2,015	9,047	10,448	903	1,614	382		401		13,748
Tieton division.....					1,410	250	1,709	7,160	584	1,574	9,483		215		9,483
Wyoming: Shoshone.....															
Gardner division.....					1,820	287	2,067								
Frankie division.....					141	60	201								
Total.....		2,564	573	51,559	702	19,506	74,904	27,560	1,980	3,747	1,186	1,818	1,545	2,669	40,505
Arizona: Salt River.....															
Arizona-California: Yuma.....		60,720		167	60,887	26,535	191,000					11,430			202,430
California: Yuma.....		18,425			18,425	17,510	52,400								52,400
California: Orland.....				167	167	3,785	11,450						254		14,700
Colorado: Grand Valley.....	1,366			3,470	4,836	5,199	11,330								12,300
Uncompahgre.....	1,533			121	1,654	6,080	63,600								63,780
Idaho: Boise.....				154	154	7,415	103,340								111,500
King Hill.....			4	40	44	4,100	5,390								5,900
Mindoka.....															
Gravity division.....	2,075			270	2,345	1,065	57,400								60,650
Pumping division.....	4,464				4,464		43,320								46,590

Summary of crop reports on Government reclamation projects in 1921—areas (acres)—Continued.

State and project.	Cereals.				Other grain and seed.						Hay and forage.						Total.		
	Barley.	Corn, In- dian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flaxseed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.		Other forage.	Pasture.
Oregon-California: Klamath.	973		1,998	410	3,205	6,586						16,375			747			8,850	25,972
South Dakota: Belle Fourche.	1,423	5,622	6,390		5,341	17,776				153		2,163	25,829		1,795	375		7,332	35,351
Utah: Strawberry Valley.	218	213	1,252		7,400	9,083						76	11,080	210	435	86	135	3,615	15,591
Washington:																			
Okanogan.																			
Yakima.																			
Sunnyside division.	453	4,177	337	102	4,970	10,039							41,534		1,301	356	294	5,990	49,465
Tieton division.	635	724	352		2,442	4,153							13,350		520	85	216	1,415	15,576
Wyoing:																			
Shoshone.	166	46	2,579	20	6,204	9,015							723	18,160	18	298		2,338	20,814
Garland division.	97	74	1,205	8	1,748	3,132				49	3	783	4,228	238	117			831	5,551
Frankie division.																			
Total.	33,574	52,506	55,427	1,511	156,621	299,639	19,571	10,804	36,546	376	243	67,542	460,528	10,998	26,345	5,426	4,119	122,418	631,829
State and project.	Vegetables and truck.						Fruits and nuts.						Total.						
	Beans.	Onions.	Pota- toes, white.	Pota- toes, sweet.	Truck.	Total.	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.		Miscel- laneous.					
Arizona: Salt River.	1,374		630		7,943	9,947													
Arizona-California: Yuma.					513	513													
California: Orland.					272	272													
Colorado:																			
Grand Valley.					120	402	257	98	3										
Uncompahgre.	188	365	282		411	11,770	1,871												
Idaho:																			
Boise.	50	38	5,200	20	982	6,290	1,371	105	26	600		158							
King Hill.			251		126	377	560					3							
Minidoka.																			
Gravety division.	22		3,533		608	4,163	359					20							
Pumping division.			6,693		342	7,065													

State and project.	Miscellaneous.					Total cropped.	Irrigated, no crop.					Total irrigated.	
	Beets, sugar.	Cotton.	Cane.	Other.	Total.		Young alfalfa.	Young fruit.	Fall plowing.	Miscellaneous.	Duplicated.		
Montana:													
Humbley.....				183		139	324						
Milk River.....				35		35	71						
Sun River.....	1												
Fort Shaw division.....				217		54	271						
Greenfields division.....				70		12	91						
Montana-North Dakota: Lower Yellowstone	30			314		198	532						
Nebraska-Wyoming:													
North Platte—													
North Platte Canal & Colonization Co. lands.....				1,634		44	1,678						
Interstate division.....	65			9,300		422	9,757						
Fort Laramie division.....	1	9		653		44	707						
Northport division.....				43		4	47						
Nevada: Newlands.....				484		129	613						
New Mexico: Carlisbad.....					11		11						
New Mexico-Texas: Rio Grande.....	700	136				3,753	5,350	242	80	454		82	856
North Dakota: North Dakota Pumping.....				81		90	161						
Oregon: Umatilla.....				83		195	278	614	38	9	13	41	715
Oregon-California: Klamath.....				96		66	162						
South Dakota: Belle Fourche.....	19			238		159	416						
Utah: Strawberry Valley.....				300		181	481	60	186	2		36	284
Washington:													
Okanogan.....				19		92	111	4,618	14	65	6	33	4,726
Yakima.....													
Sunnyside division.....				7,032		2,015	9,047	10,448	903	1,614	382	401	13,748
Tieton division.....	24			1,410		250	1,700	7,160	524	1,574		215	9,483
Wyoming:													
Shoshone—													
Gardland division.....				1,820		287	2,047						
Franlie division.....				141		60	201						
Total.....	2,564	573		51,559	702	19,508	74,904	27,560	1,980	3,747	1,186	1,545	2,669
													40,505
Arizona: Salt River.....		60,720		167	60,887	26,335	191,000				11,430		202,430
Arizona-California: Yuma.....		18,425			18,425	17,510	32,400						32,400
California: Orland.....				167	167	3,785	11,450	1,022	2,041	441		254	14,700
Colorado:													
Grand Valley.....	1,366			3,470	4,866	5,199	11,380	815	6	1,166	479	1,556	12,300
Uncompahgre.....	1,533			3,121	1,654	6,080	63,600	3,177	17	4,670	400	8,104	63,760
Idaho:													
Boise.....				154	154	7,415	103,340	6,700	35	190	1,425		111,500
King Hill.....			4	40	44	5,380	5,380	303	17				5,800
Minidoka—													
Pumping division.....	2,075			270	2,345	1,085	57,400	2,300	50			960	60,650
Gravity division.....	4,464				4,464	43,820	43,820	1,476	137			803	46,590

Summary of crop reports on Government reclamation projects in 1921—areas (acres).—(Continued.)

State and project.	Miscellaneous.				Total cropped.	Irrigated, no crop.				Total irrigated.		
	Beets, sugar.	Cotton	Cane	Other.		Total.	Dupli- cated areas.	Young alfalfa.	Young fruit.		Fall plowing.	Miscella- neous.
Montana:												
Huntley.....	2,839			379	3,218	15,476	18,440				360	18,800
Milk River— Sun River.....						250	16,110	280				16,400
Fort Shaw division. Greenfields division.....				14 15	14 15		8,700 12,860				30 450	2,890 12,940
Montana-North Dakota: Lower Yellow- stone.....												
Nebraska-Wyoming: North Platte— North Platte Canal & Colonization Co. lands.....	1,533		25	18	1,576	1,533	19,980					19,980
Fort Laramie division.....			8	2	1,406		10,860	966				11,020
Northport division.....				150	14,995		85,580	4,916		803		86,350
Nevada: Newlands.....			5	18	840		12,140	512		10		12,150
New Mexico: Carlsbad.....							1,800			450		2,250
North Dakota: Texas: Rio Grande.....							43,440	540		2,720		46,160
North Dakota: North Dakota Pumping.....		18,400	324	1,448	18,832	10,361	21,620	540		1,650		23,810
Oregon: Umatilla.....		4,542	1,587	432	6,561	2,306	77,660	270	444	7,206		85,580
Oregon-California: Klamath.....				16	16	400	11,960	81		228	195	2,060
South Dakota: Belle Fourche.....				39	39	291	1,610	1,189	73	3,380	80	13,130
Utah: Strawberry Valley.....	926			48	974	1,580	32,720					36,100
Washington: Okanogan.....	5,180			715	5,895	55,100	31,380	960	9	121		55,100
Yakima.....				54	54	722	5,330	10	310			32,500
Wyoming: Sunnyside division.....	1,827			138	1,965		80,680	2,366	814			5,650
Teton division.....	43			262	305	3,584	27,200	576	1,442	11,560	940	94,500
Shoshone— Garland division.....						4,026				568	1,286	28,500
Frankie division.....	1,508			23	1,531		34,170	861	62	102	682	34,570
Total.....	40,865	102,087	1,953	8,268	153,203	109,722	1,157,900	30,659	5,463	7,399	48,358	1,227,500

\* Figures for Fort Shaw Division, Sun River project, are for 208 irrigated farms covering an irrigated acreage of 8,880, in addition to which there were irrigated in town sites 22 acres and for miscellaneous purposes 8 acres.

\* Figures for Greenfields Division, Sun River project, are for 166 irrigated farms, all but 450 acres of which produced crops.

Summary of crop reports on Government reclamation projects in 1921 - Total yields.<sup>1</sup>

State and project.	Cereals.					Other grain and seed.						Hay and forage.						
	Barley.	Corn, Indian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flax seed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.	Other forage.	Total.
Bushels.	Bushels.	Bushels.	Bushels.	Bush.	Bushels.	Bushels.	Bush.	Bush.	Bushels.	Bush.	Bush.	Bushels.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Arizona: Salt River.....	633,288	83,086	268,966		800,737	1,316,067			882,680			882,680	180,434		30,832		220,286	
Arizona-California: Yuma.....	38,963				9,678	48,273	57,000		268,500			325,500	54,266		420		54,686	
California: Orland.....	24,656				2,062	26,718			85,200			85,200	23,638		743		25,315	
Colorado:																		
Grand Valley.....		19,256	33,215		34,855	87,306							12,035		78	1,644	13,757	
Uncompahgre.....	2,545	60,637	185,840	235	354,273	603,528	548	531				1,079	62,520	159	517	1,683	68,302	
Idaho:																		
Boise.....	89,000	224,325	86,275	2,520	917,890	1,320,040	4,280	35,220			264	39,764	196,358	12,245	124	3,950	212,677	
King Hill.....	842	1,595	1,578		3,049	7,064	327	12				339	14,700	14		203	14,917	
Minidoka—																		
Gravity division.....	33,104	33,330	129,933	5,425	341,022	542,834	765	7,711				8,476	85,940	4,029	202	1,563	819	
Pumping division.....	16,546	1,185	41,557	160	301,070	360,518	703	3,277				3,980	41,588	699		69	42,356	
Montana:																		
Huntley.....	5,906	7,307	35,191		93,684	142,068	136	168				304	9,564	34			9,868	
Milk River.....	225	4,398	26,939		31,173	62,735	144			512		656	5,775		5,927	365	12,097	
Sun River.....																		
Fort Shaw division.....	1,939	1,117	11,415		17,496	31,967	76	325				401	9,793	34	113		9,940	
Greenfields division.....	2,413		22,838		149,250	174,501	39			130		169	1,764	17	400		2,181	
Montana-North Dakota:																		
Lower Yellowstone.....																		
Nebraska-Wyoming:																		
North Platte—	4,925	15,199	35,255		58,318	113,697		56		572		628	13,338	64	1,532	196	242	
North Platte Canal & Colonization Co. lands.....																		
Interstate division.....	4,088	28,941	30,355	1,072	5,220	69,696							7,285		160			7,445
Fort Laramie division.....	100,079	199,765	236,359	2,861	62,803	664,857	126	268		1,483		1,916	53,869		400	284	96	54,859
Northport division.....	206	15,785	48,902		66,434	131,227		50				50	2,642		397	11		3,050
Nevada: Newlands.....	80	9,330	5,543		5,192	20,115							188					188
New Mexico: Carlisbad.....	19,385		3,000		66,867	89,252							95,539		289			96,118
New Mexico-Texas: Rio Grande.....		42,184	9,221		6,327	57,732	2,615		5,828			8,443	21,763			151		21,944
North Dakota: North Dakota Pumping.....	9,686	285,573	27,268	30	144,515	477,072	824		4,681			5,505	90,902		2,188	3,917	17	97,024
Oregon: Umatilla.....	1,470	1,470	5,035			7,975							1,057	130				2,426
Oregon-California: Klamath.....	902	3,006		200	520	4,628	241					241	36,355		191	375		36,921
South Dakota: Belle Fourche.....	21,778		72,594	5,690	68,219	168,281							48,515		817			49,332
Utah: Strawberry Valley.....	18,850	110,420	88,600		54,880	272,750	1,208	1,110		200		2,518	43,238		1,552	309		45,099
	10,331	5,288	53,906		202,701	272,226		356				356	35,743	334	879	929	1,902	49,787

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1920, to September, 1921.

Summary of crop reports on Government reclamation projects in 1921—Total yields—Continued.

State and project.	Cereals.					Other grain and seed.					Hay and forage.							
	Barley.	Corn, Indian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flax seed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.	Other forage.	Total.
	Bushels.	Bushels.	Bushels.	Bush.	Bushels.	Bushels.	Bush.	Bush.	Bushels.	Bush.	Bush.	Bushels.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Washington:																		
Okanogan.....													1,910		169	18		2,097
Yakima.....																		
Sunnyside division.....	13,137	150,372	17,524	1,938	139,160	322,131							176,520		3,253	3,204	3,528	186,505
Tieton division.....	20,280	26,604	11,402		66,140	124,426							40,996		679	279	2,240	44,104
Wyoming:																		
Shoshone—																		
Garland division.....	4,744	1,014	65,219	100	137,685	208,762	9	611				620	32,920	18	186			33,124
Frankie division.....	742	520	14,284	32	15,068	30,666	53	1,222			120	12	8,055	245	116	10		8,426
Total.....	1,080,310	1,301,707	1,601,124	20,253	3,655,728	7,659,122	69,083	50,947	1,246,889	1,534	1,769	1,370,232	1,418,950	18,022	53,079	19,654	12,901	1,522,606
State and project.	Vegetables and truck.					Fruits and nuts.					Miscellaneous.							
	Beans.	On-ions.	Pota- toes, white.	Pota- toes, sweet.	Total.	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.	Miscellaneous.	Total.	Beets, sugar.	Cotton seed.	Cane.		
	Bush.	Bush.	Bush.	Bush.	Bushels.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Tons.	Pounds.	Tons.		
Arizona: Salt River.																		
Arizona—California:																		
Yuma.....																		
California: Orland.																		
Colorado:																		
Grand Valley.....	28,279				28,279	2,086,850							2,086,850	15,482				
Uncompangre.....	2,315	180,468	1,889,572		2,012,355	9,150,000	133,300	7,650	6,300				9,431,220	15,885				
Idaho:																		
Boise.....	575	3,040	1,352,000	4,300	1,359,915	12,710,000	840,000	182,000	3,000,000				18,522,000					
King Hill.....													100,100					
Minidoka.....																		
Gravity di- vision.....																		
Pumping di- vision.....	167		603,546		603,713	1,224,000												
Montana:																		
Huntley.....																		
Milk River.....	13		18,500		18,500													
Sun River.....			6,724		6,747													
Fort Shaw division.			26,639		26,639													
Greenfields division.			8,997		8,997													

Montana-North Dakota-Lower Yellowstone.....	420	40,732	41,152						12,784			37		
Nebraska-Wyoming-North Platte-North Platte-Central & Colorado-Columbia Co. lands.....		258,428	258,428							15,513		12		
Interstate division-Fort Laramie division-Northport division.....	284	1,228,983	1,229,247							108,904				
Nevada-Newlands-New Mexico: Carlsbad.....	15	2,150	81,486							6,287		7		
New Mexico-Texas: Rio Grande.....		2,150	2,150							3,280				
North Dakota: Pumping.....		93,067	93,067											
Oregon-Umatilla.....		38,100	38,100											
Oregon-California: Klamath.....		63,628	63,628											
South Dakota: Belle Fourche.....		12,029	11,513											
Utah: Strawberry Valley.....														
Washington: Okanogan-Yakima-Sunnyside division-Tieton division.....	545	8,240	247,286											
Wyoming: Shoshone-Gardiner division-Frannie division.....														
Total.....	38,302	175,411	9,914,040	107,029	10,234,782	238,317,915	10,833,637	18,046,106	5,292,962	12,073,900	4,082,937	8,860,210	86,420,800	6,364



Summary of crop reports on Government reclamation projects in 1921—Total crop values.<sup>1</sup>

State and project.	Cereals.					Other grain and seed.						
	Barley.	Corn, Indian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flax- seed.	Millet seed.	Total.
Arizona: Salt River.	\$356,225	\$63,066	\$138,715		\$360,885	\$948,881			\$551,686			\$551,686
Arizona-California: Yuma.	21,700				10,860	32,560			155,360			633,330
California: Orland.	13,561				2,062	15,623			59,640			59,640
Colorado:												
Grand Valley.		13,468	14,754		27,308	55,530						6,272
Uncompahgre.	1,213	34,628	66,368	\$141	241,586	342,836		\$3,013				
Idaho:												
Boise.	40,320	112,164	30,198	1,134	687,990	871,806	30,816	274,716			\$211	305,743
King Hill.	510	1,828	1,368		3,667	7,403	2,388	576				2,964
Mindoka—												
Gravity division.	13,242	23,331	32,488	4,340	272,820	346,221	6,885	69,400				76,285
Pumping division.	6,628	6,880	10,389	128	240,858	258,853	6,327	29,493				35,820
Montana:												
Huntley.	2,707	4,991	13,873		94,520	116,091	607	744		\$793		1,351
Milk River.	90	4,398	10,775		34,280	49,553	2,592					3,385
Sun River.												
Fort Shaw division.	970	670	5,708		15,750	23,098	914	2,603				3,517
Greenfields division.	1,206		11,420		134,825	146,951	468			175		3,517
Montana-North Dakota: Lower Yellowstone.	1,970	8,360	14,102		58,320	82,752		140		858		998
Nebraska-Wyoming:												
North Platte—												
North Platte Canal & Colonization Co. lands.	1,432	10,129	7,589	536	3,922	23,608					1,463	5,300
Interstate division.	35,028	56,918	49,840	1,430	47,102	199,318	1,125	2,682				450
Fort Laramie division.	72	5,525	12,200		49,824	67,621		450				
Northport division.	24	2,800	1,940		4,676	9,440						
Nebraska: Newlands.	10,660		1,440		60,180	72,260						
New Mexico-Texas: Rio Grande.		18,308	4,546		6,122	28,976			2,388			19,520
North Dakota: North Dakota Pumping.	7,074	211,725	22,834	40	171,584	413,257	3,533		3,541			6,984
Oregon: Umatilla.	7,705	882	1,760			3,347						
Oregon-California: Klamath.	622	2,465		200	582	3,869	2,862					2,862
South Dakota: Belle Fourche.	11,542		26,859	3,186	61,397	102,964						
Utah: Strawberry Valley.	7,840	55,210	28,352		46,268	140,395	14,496	2,220		260		16,965
Washington:	5,682	3,173	24,268		152,025	185,138		1,780				1,780
Wyoming:												
Shoshone—												
Garland division.	1,898	406	20,870	100	117,032	140,306	32	1,833				1,965
Framie division.	297	208	4,571	32	12,826	17,933	191	3,666		156	43	4,066
Total.	559,327	769,228	577,787	13,011	3,116,862	5,036,215	871,447	393,316	772,616	2,232	1,747	1,741,337

<sup>1</sup> Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1920, to September, 1921.

State and product.	Hay and forage.					Vegetables and truck.							
	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.	Other forage.	Pasture.	Total.	Beans.	Onions.	Potatoes, white.	Potatoes, sweet.	Truck.	Total.
Arizona: Salt River.	\$1,964,340		\$257,331			\$408,038	\$2,557,709	\$78,318		\$151,105		\$1,091,666	\$1,324,069
Arizona-California: Yuma.	430,378		2,287			34,000	460,665					42,960	42,960
California: Orland.	239,380		8,173		\$9,340	32,611	286,344					25,260	25,260
Colorado:													
Grand Valley.	93,112		333	\$3,100	4,205		100,750			21,004		10,709	31,713
Uncompahgre.	352,335	\$804	2,476	1,821	17,903	27,814	383,153	8,746	\$213,945	1,252,310		43,658	1,318,659
Idaho:													
Boise.	785,432	48,980	496	15,800		117,000	968,308	2,070	4,500	1,332,000	\$8,600	196,728	1,563,955
King Hill.	62,810	66	1,682	367		1,292	66,417			32,853		7,020	39,873
Mindoka.													
Gravity division.	429,700	16,116	606	4,779	4,095	50,800	506,096	501		464,462		48,400	513,863
Pumping division.	207,940	2,706		207		16,895	227,838			936,389		9,560	965,949
Montana:													
Huntley.	76,234	206	35,566	1,580		31,461	107,991			15,065		11,939	27,001
Milk River.	28,875						66,021	32		5,734		5,105	10,871
Sun River.													
Fort Shaw division.	58,758	170	613			3,921	63,462			21,311		5,400	26,711
Greenfields division.	12,348	102	2,870			444	15,764			7,827		1,400	9,277
Montana-North Dakota: Lower Yellowstone.	86,665	256	6,128	781	5,965	3,115	102,943	1,060		24,440		13,463	38,953
Nebraska-Wyoming:													
North Platte.													
lands.	32,782		800			168	33,750			166,675		2,200	168,875
Interstate division.	242,850		2,450	568	394	8,340	254,692	426		798,826		17,172	816,424
Fort Laramie division.	11,899		1,985	22		14,462	14,358	22	6,450	52,966		4,050	63,488
Northport division.	1,130						1,130			1,290		1,350	1,440
Nevada: Newlands.	958,290		2,880	755		54,420	1,015,600			111,680		14,692	126,372
New Mexico: Carlsbad.	183,768					5,573	190,094				2,465		2,465
New Mexico-Texas: Rio Grande.	1,251,358		17,363	15,120	1,060	67,255	1,352,144	29,537	15,749		75,826	246,169	367,290
North Dakota: North Dakota Pumping.	10,570	1,300	1,770	3,470		3,750	26,860			9,260		11,368	26,548
Oregon: Umatilla.	249,760		1,647	2,044		8,125	261,476			7,572		19,946	27,318
Oregon-California: Klamath.	242,575		4,065			53,100	295,760			19,306		9,900	29,206
South Dakota: Belle Fourche.	216,190		7,610	1,545		36,760	262,055	460		27,616		8,940	37,016
Utah: Strawberry Valley.	357,430	3,340	8,780	4,645	11,412	12,600	388,217			32,178		18,905	51,083
Washington:													
Okanogan.	22,920		2,028	180		1,802	26,930			3,350		15,240	18,590
Yakima.													
Sunnyside division.	1,412,160		29,277	12,816	24,666	89,700	1,568,649			1,476,740		403,000	1,979,740
Tieton division.	368,964		6,111	558	10,080	28,300	414,013	1,308	14,832	1,160,735		25,000	1,201,575
Wyoming:													
Shoshone.	164,600	90	744			18,077	163,511			184,394		19,365	203,759
Garland division.	40,275	1,225	464	30		3,663	45,657			6,923		3,782	9,705
Franklin division.													
Total.	10,505,944	75,541	412,475	70,391	98,130	1,118,086	12,268,567	122,470	255,536	7,366,051	88,800	2,333,174	10,164,121

Summary of crop reports on Government reclamation projects in 1921—Total crop values—Continued.

State and project.	Fruits and nuts.						Miscellaneous.						Grand total.
	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.	Miscellaneous.	Total.	Beets, sugar.	Cotton and cotton seed.	Cane.	Other.	
Arizona: Salt River.....					\$639, 870	\$225, 570	\$280, 192	\$1, 145, 632		\$4, 903, 025		\$3, 758	\$4, 907, 383
Arizona-California: Yuma.....							10, 000	10, 000		857, 625		55, 000	912, 625
California: Orland.....		\$1, 647		\$10, 654	23, 832	3, 875	47, 400	87, 408				21, 375	408, 810
Colorado:													
Grand Valley.....	\$46, 473							46, 473	\$100, 630			21, 634	356, 730
Uncompahgre.....	245, 660	6, 902	\$210	469		10, 638		263, 879	89, 922			99, 501	2, 614, 300
Idaho:													
Boise.....						55, 300		475, 107				19, 021	4, 203, 940
King Hill.....	324, 927	33, 600	7, 280	54, 000		190		2, 480			\$80	13	119, 210
Mindoko.....	2, 260												
Gravity division.....	24, 480					2, 325		26, 805	141, 710			30, 640	1, 641, 140
Pumping division.....									279, 700				1, 768, 140
Montana:													
Huntley.....									183, 339			4, 974	188, 333
Milk River.....													
Sun River.....													
Fort Shaw division.....												632	117, 440
Greenfields division.....												355	173, 940
Montana - North Dakota: Lower													
Yellowstone.....									74, 786		228	3, 560	304, 220
Nebraska-Wyoming:													
North Platte.....													
North Platte Canal & Colo-									104, 713		24	10	104, 747
nization Co. lands.....									1, 126, 602			4, 584	2, 406, 920
Interstate division.....									42, 302		14	697	183, 980
Fort Laramie division.....									23, 660				33, 990
Northport division.....												40, 328	40, 328
Nevada: Newlands.....										666, 900	5, 215	6, 490	1, 254, 580
New Mexico: Carlsbad.....										260, 045	33, 142	24, 538	919, 650
New Mexico-Texas: Rio Grande.....													
North Dakota: North Dakota	8, 103	4, 375	16, 622			5, 320		34, 420					2, 485, 710
Pumping.....												3, 565	54, 320
Unatilla.....	36, 948	3, 172	1, 075	725		4, 542		46, 462				1, 673	343, 890
Oregon-California: Klamath.....													431, 960
South Dakota: Belle Fourche.....									56, 408			890	513, 760
Utah: Strawberry Valley.....	10, 603	61, 220	986			6, 203		78, 860	304, 590			993	1, 020, 590

[illegible]

# WARREN ACT CONTRACTS.

*Contracts under Warren Act.*

## GRAND VALLEY PROJECT, COLORADO.

Name of contractor.	Date of contract.	Area in acres.	Amount of water.
Orchard Mesa irrigation district .....	Feb 18, 1922	10,000	<i>Second-feet.</i> 400
Total from previous years (2 contracts) .....		8,400	120
Grand total .....		18,400	520

## UNCOMPAHGRE PROJECT, COLORADO.

Daly, J. A. ....	May 4, 1921	7	0.12
Keller, Lena .....	Sept. 29, 1921	78	1.30
Marks, Constant R., Jr., et al. ....	Dec. 10, 1921	14	.23
Prather, Bertie L. ....	Sept. 30, 1921	27	.45
Smith, Clara B. ....	Sept. 30, 1921	14	.23
Tobin, John J., et al. ....	Dec. 30, 1921	39	.65
Total .....		179	2.98
Total from previous years (3 contracts) .....		461	8.32
Grand total .....		640	11.30

## BOISE PROJECT, IDAHO.

Boise-Mora and Hillcrest irrigation districts .....	Sept. 16, 1921	14,100.00	<i>Acres-feet.</i> 23,000.00
Emmett irrigation district .....	Nov. 18, 1921	22,500.00	120,000.00
Total .....		36,600.00	143,000.00
Total from previous years (14 contracts) .....		176,360.44	187,847.35
Grand total .....		212,960.44	330,847.35

## MINIDOKA PROJECT, IDAHO.

AMERICAN FALLS. <sup>1</sup>			
No contracts during past year.			
Total from previous years (24 contracts) .....		499,569	333,520
JACKSON LAKE.			
(Temporary rental contracts—season of 1921.)			
Bloom, Jacob .....	July 20, 1921		50
Boden, Ernest .....	Aug. 8, 1921		62
Fact, O. E. ....	July 26, 1921		50
Hansten, Christian .....	July 15, 1921		100
Harward, L. J. ....	July 1, 1921		50
Idaho Falls .....	July 24, 1921		350
Milner Low Lift irrigation district .....	July 15, 1921		1,947
Do. ....	July 26, 1921		272
Do. ....	Aug. 5, 1921		106
Do. ....	Aug. 15, 1921		216
Peterson, Miralda .....	May 3, 1921		
Simpson, J. S. ....	July 20, 1921		50
Utah Power & Light Co. ....	July 22, 1921		100
Vance, S. E., Jr. ....	July 2, 1921		150
Do. ....	July 15, 1921		150
Do. ....	July 23, 1921		400
Do. ....	July 28, 1921		400
Do. ....	Aug. 1, 1921		260
Do. ....	Sept. 10, 1921		107
Total .....			4,810
Total from previous years (22 contracts) .....		846,900	532,916
Grand total .....		846,900	537,726

<sup>1</sup> Contracts in connection with construction of American Falls Dam; no water furnished.

# WARREN ACT CONTRACTS.

171

*Contracts under Warren Act—Continued.*

## NORTH PLATTE PROJECT, NEBRASKA-WYOMING.

Name of contractor.	Date of contract.	Area in acres.	Amount of water.
Single Water Users' Association .....	May 10, 1922	2,488	<i>Second-foot.</i> 4,060
Dawson County Irrigation Co. ....	May 1, 1922	( <sup>2</sup> )	2,500
Total .....			6,560
Total from previous years (11 contracts) .....		122,135	340,572
Grand total .....			347,132

## KLAMATH PROJECT, OREGON-CALIFORNIA.

Geary Investment Co. et al. ....	Aug. 10, 1921	4,193.74	( <sup>3</sup> )
Klamath drainage district .....	Aug. 24, 1921	27,500.00	( <sup>3</sup> )
Langell Valley and Horsefly irrigation districts .....	Mar. 27, 1922	8,350.00	16,700
Total .....		40,043.74	
Total from previous years (3 contracts) .....		8,324.00	16,668
Grand total .....		48,377.74	

## BELLE FOURCHE PROJECT, SOUTH DAKOTA.

No contracts during past year.			
Total from previous years (2 contracts) .....		54.8	

## STRAWBERRY VALLEY PROJECT, UTAH.

No contracts during past year.			
Total from previous years (8 contracts) .....		29,060.00	22,135.00

## YAKIMA PROJECT, WASHINGTON.

Broadway Irrigation Co. ....	Dec. 1, 1921	400.00	700.00
Yakima-Benton Irrigation district .....	July 8, 1921	( <sup>3</sup> )	285,000.00
Yakima Irrigation district .....	Nov. 3, 1921	( <sup>3</sup> )	100,000.00
Total .....			445,700.00
Total from previous years (12 contracts) .....		144,850.27	481,759.75
Grand total .....			927,459.75

<sup>1</sup> Not known.

<sup>2</sup> Undetermined.

<sup>3</sup> Estimated.



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**DEPARTMENT OF THE INTERIOR**

HUBERT WORK, SECRETARY

**BUREAU OF RECLAMATION**

DAVID W. DAVIS, Commissioner

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**TWENTY-SECOND ANNUAL REPORT**

OF THE

**BUREAU OF RECLAMATION**

**Transmitted** to Congress in pursuance of the  
**Act of June 17, 1902 (32 Stat. 388)**

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1922-1923



WASHINGTON  
**GOVERNMENT PRINTING OFFICE**  
1923



**DEPARTMENT OF THE INTERIOR**

**HUBERT WORK, SECRETARY**

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GOVERNMENT PRINTING OFFICE  
1923**

## LETTER OF TRANSMITTAL.

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DEPARTMENT OF THE INTERIOR,  
BUREAU OF RECLAMATION,  
*Washington, August 30, 1923.*

THE SECRETARY OF THE INTERIOR.

DEAR MR. SECRETARY: There is submitted herewith a manuscript for the twenty-second annual report of the Bureau of Reclamation covering the fiscal year ending June 30, 1923. I took office as commissioner only 10 days before that date and hence the attached report covers a period of operations with which I had little or nothing to do. The call upon field offices for contributions to this report had been sent out and the resulting material largely brought together before my appointment.

In view of all the circumstances, it seems fitting to submit this material as thus prepared. Later I may have occasion to submit a special report prepared more completely under my own direction.

Respectfully,

D. W. DAVIS, *Commissioner.*

# TWENTY-SECOND ANNUAL REPORT OF THE BUREAU OF RECLAMATION.

## GENERAL DISCUSSION.

During the past fiscal year, which ended on June 30, 1923, the irrigation projects of the Bureau of Reclamation were still suffering from the general depression in agriculture. However, the prices received by the farmers for their crops were beginning to be more favorable, and as a consequence there was a somewhat more optimistic attitude on the part of the water users than has prevailed for the past few years.

Increased interest was shown in the building up of the dairy herds on many of the projects and thus utilizing to advantage the large acreage in alfalfa by a concentration of products. Several new creameries and cheese factories were started or planned and the outlook for this branch of agricultural industry was particularly favorable. As a rule farmers on those projects where fruit is the principal crop made some money, and were in a generally satisfactory condition financially. Similarly, in the case of growers of sugar beets, the cash prices received for this crop, augmented by the bonuses paid later by the sugar companies, based on the sugar content of the beets and the price of refined sugar, aided materially in producing a more optimistic outlook. On the other hand the general slump in the price of potatoes was a marked deterrent to the forward movement and resulted in considerable hardship on a number of the projects, where this was one of the principal crops. However, many farmers capitalized the situation by fattening hogs for market on an otherwise unmarketable product.

More than 450,000 persons are living on the 33,000 farms irrigated by the bureau and in the project towns and cities. Of the 3,000,000 acres comprised in the 25 project constructed or under construction by the bureau, water was furnished in 1922 to 1,202,130 acres. Of this area 1,169,100 acres were cropped in that year, producing crops having a gross value of more than \$50,000,000, or an average of about \$43 per acre. Additional lands, largely included in private or district projects and receiving a supplemental water supply under the Warren Act from the works of the bureau, yielded crops having a gross value of \$33,000,000 more. The accompanying table shows the irrigable, irrigated, and cropped acreage, and the value of crops grown on the projects of the bureau during the past several years:

*Irrigable, irrigated, and cropped acreage, and crop value.*

Year.	Irrigable acreage.	Irrigated acreage.	Cropped acre- age.	Crop value.
1913.....	1,181,362	694,142	637,227	\$15,676,411
1914.....	1,240,875	761,271	703,424	16,475,517
1915.....	1,330,222	814,906	757,613	18,164,452
1916.....	1,405,452	922,821	858,291	32,815,972
1917.....	1,502,468	1,026,663	966,784	56,462,313
1918.....	1,661,934	1,119,598	1,051,198	66,821,396
1919.....	1,636,159	1,187,255	1,113,469	88,974,137
1920.....	1,661,960	1,225,490	1,153,820	66,171,650
1921.....	1,674,100	1,227,500	1,187,900	49,620,300
1922.....	1,692,700	1,202,130	1,169,100	50,360,860

The total estimated gross value of crops raised on these projects since water was first available for irrigation, exclusive of those served under the Warren Act, is more than \$500,000,000.

In general the percentage distribution of the acreages of the principal crops grown on the projects, as shown by the crop census, follows rather closely that of the previous year. There was a slight decrease in the percentage of the total acreage represented by the cereals, grain and seed, and hay and forage; and increases in the percentages represented by vegetables and truck, fruit and nuts, and miscellaneous crops. Among the latter the largest increase was in cotton, which advanced during the year from 9 per cent to 12.6 per cent of the total cropped acreage. There was also a material increase in the acreage of white potatoes, which doubtless intensified the serious situation on many projects following the decline in price of this crop.

As in the previous year, alfalfa led all other crops both in point of acreage and value, followed by wheat from the standpoint of acreage, and by cotton and cottonseed from that of value. Apples, although representing only a small percentage of the acreage, stood third in value of the crop.

### REORGANIZATION OF THE WORK.

Shortly after assuming office, the Secretary of the Interior came to the conclusion that more attention should be paid to aiding and cooperating with the settlers along business and agricultural lines if the projects were to be a complete success. With this idea in view, he appointed Miles Cannon, former commissioner of agriculture of the State of Idaho, to the post of field reclamation commissioner, with headquarters to be later established in one of the Western States; and shortly before the close of the fiscal year abolished the position of director of the Reclamation Service, and appointed David W. Davis, former governor of Idaho, to the position of Commissioner of the Bureau of Reclamation, with headquarters in Washington, D. C.

The purpose of these appointments was to improve the reclamation projects along business and agricultural lines, and to coordinate various agricultural activities; to aid the farmers in raising better and more diversified crops, and in applying modern business methods in handling, marketing, and realizing upon the crops produced; to effect economies wherever possible; and in every way to improve not only the condition of the water users on the projects, but the administration of the projects by the Department of the Interior.

At Denver, under the chief engineer, is a force of technical men for the design of the principal engineering structures, including work of an electrical nature. That is the headquarters point for extensive purchases; and the chief engineer and his two assistants alternate in charge of the office and traveling from one project to another to maintain close administration and give prompt advice and decision on engineering and other details.

Each project is in administrative charge of a project manager. The project force includes the necessary engineers, clerical help, and operatives such as gate tenders, ditch riders, and water masters for the work of constructing, operating, and maintaining the irrigation systems, with sufficient common and skilled labor for the work in hand.

The legal work of the Bureau of Reclamation both in the Washington office and in the field is in charge of the chief counsel. There are eight field offices of the legal division located, respectively, at Denver, Colo.; Montrose, Colo.; Mitchell, Nebr.; Helena, Mont.; Boise, Idaho; Portland, Oreg.; San Francisco, Calif.; and Las Cruces, N. Mex. The attorneys in charge of these offices are the legal advisers to the various project managers located within their respective districts. In the central Denver office is located a district counsel who is legal adviser to the chief engineer.

On June 30, 1923, the force of the Bureau of Reclamation comprised 4,435 persons, subdivided as follows: Educational, 515; registered, 1,293; laborers, 2,627. In addition, the employees of contractors working on reclamation projects numbered 251.

### THE LENIENCY ACT.

Owing to the continued depressed condition of agriculture Congress amended the act of March 31, 1922, by the passage of the act of February 28, 1923 (Public No. 454), the two acts together being known as the leniency act. This law applies to all Federal irrigation projects constructed or being constructed under the reclamation law, and permits three classes of relief to the settlers, namely: (a) Extension of time of payment of construction charges due in 1922 or prior thereto to any date not beyond December 31, 1924; (b) the furnishing of irrigation water during the season of 1923, notwithstanding a delinquency of more than one year in the payment of any operation and maintenance or construction charges; and (c) the distribution of accrued operation and maintenance and construction charges for the year 1922 and prior thereto, over the period covered by the remaining construction installments, in those cases where the water users are unable to pay such accrued charges on or before December 31, 1924.

At the close of the fiscal year 1,067 applications under the act had been received at the Washington office of the Bureau of Reclamation, and it was estimated that the total number of applications would amount to about 3,350.

### PROJECT LAND IRRIGABLE BUT NOT IRRIGATED.

Recent crop censuses have shown an area of about 450,000 acres on the projects listed as irrigable, but not irrigated. It was known in a general way that this acreage comprises land that is being put to some profitable use, although not irrigated, and land lying idle. In the first class is land occupied by buildings, corrals, roads, etc.; land cultivated or pastured without irrigation; and land profitably used in other ways. On the other hand are small acreages of public land awaiting entry and tracts of State, railroad, and Indian lands in process of subdivision and settlement; land temporarily withheld from settlement for a seasoning of the canals or for some other reason; land which has become seeped; land in process of being reclaimed by a new settler who has not the means to cultivate his entire acreage; and land held by nonresident owners which is not being irrigated or cropped or put to other profitable use.

During the fiscal year effort was made to secure more definite information concerning this comparatively large area of irrigable but not irrigated land, and the results are shown in the accompanying summary table.



*Classification of irrigable but not irrigated land on projects.*

Class.	Acres.	Per cent.
Occupied by farm buildings, schools, canals, laterals, roads .....	85,712	19.0
Overflowed, seeped, and alkaliéd.....	34,441	7.6
Rough and slough lands.....	11,195	2.5
Largely in pasture and summer fallow.....	26,128	5.8
Not farmed for financial and other reasons.....	99,857	22.0
Cultivated, but not irrigated owing to wet season, or dry farmed.....	55,569	12.3
Private holdings not developed; excess land.....	41,515	9.2
Nonresident ownership.....	42,003	9.3
State, railroad, and Indian lands.....	11,921	2.6
Public land withdrawn and unentered.....	43,873	9.7
Total.....	452,224	100.0

The table shows that of the total area of 452,224 acres 167,419 acres, or 37.1 per cent, comprising land occupied by buildings, canals, etc.; land in pasture and summer fallow; and land dry farmed; were in profitable use; whereas 284,805 acres, or 62.9 per cent, were not being used for the cultivation of crops or in other profitable manner. It may be safe to assume that the 99,857 acres of land not farmed for financial or other reasons were held out of cultivation largely because of the agricultural depression of the past two years and that much of this will be brought into cultivation with more prosperous conditions. Of the 184,948 acres remaining, the largest element is represented by the 83,518 acres in private holdings not developed and in undeveloped land in nonresident ownership. Probably the formation of irrigation districts would force a large part of this land into cultivation and the settlement campaigns on the projects should also dispose of much of this land. The remaining 101,430 acres comprised overflowed, seeped, and alkaliéd land, much of which will presumably come into cultivation again with the extension of drainage; rough and slough lands, perhaps not worth the expense of developing; State, railroad, and Indian lands, and land withdrawn and unentered, the development of which will probably be gradual, depending on economic conditions and the intensity of the demand for farms. Most of the unentered farm units available are the culls from previous openings and are not particularly attractive, but with the settlement campaigns being conducted on a number of the projects, these should be gradually taken up by men with the means to bring them into a state of production.

**PROJECT OPERATIONS.**

During the fiscal year construction and operation and maintenance of irrigation and drainage works were continued.

In Arizona the water users' association, operating the Salt River project, sold a bond issue of \$1,800,000 and began work on a 200-foot dam at Mormon Flats and completed installation of gates in the spillways at Roosevelt Dam, thus increasing the storage capacity by 270,000 acre-feet. They also extended the drainage system and completed enlargement of 4 miles of the Eastern Canal, besides contributing \$116,000 toward the \$550,000 cost of the Cave Creek flood-control dam, which has been completed. During the year the new South Consolidated power plant was 50 per cent completed and the county completed 310 miles of concrete paved roads largely within the project at a cost of \$8,000,000.

The Yuma project is partly in Arizona and partly in California. Construction work on the project proper was largely confined to the drainage system, which was extended to seeped areas needing relief. The Valley drainage pumping plant was extended by the installation of one additional screw pump which, together with one of the old pumps, was equipped for electric operation. Power was being obtained from the Southern Sierra power station pending construction of a project power plant. In order to deliver the power to the drainage pumps a transmission line was built from the B lift of the Yuma Mesa irrigation system. Lands on the Yuma Mesa for which it was possible to construct pumping and irrigation works with the funds made available under the act of January 25, 1917, were furnished water with power temporarily secured from the Southern Sierra power system, pending the payment of sufficient charges to construct a project power plant.

The Orland project, California, continued its record of no delinquencies, the water users' association remitting in full the amounts of both the installment of the building charge and the minimum operation and maintenance charge on the due dates. Lining of 9 miles of laterals with concrete constituted the chief construction feature and the installation of an additional auxiliary gate at East Park Dam was the only unusual item of maintenance.

The Grand Valley project, Colorado, has been completed far enough to serve 30,000 acres in the gravity division and water was being furnished on a rental basis. Construction work on this division was limited to building a few lateral extensions and digging drains required to maintain the productivity of the lands under irrigation. The most important construction work in progress was the reconstruction of the irrigation system of the Orchard Mesa irrigation district. This is a private system, consisting largely of wooden structures which were about to fail, which was taken over as a division of the project and will be rehabilitated at a cost of approximately \$1,000,000.

The Uncompahgre project, Colorado, was operated under public notice. Construction work comprised the enlargement and extension of private laterals turned over to the United States, and the installation of necessary minor structures.

The Boise project, Idaho, was operated under public notice. With the operation and maintenance cost there was levied, under court decree, a special drainage assessment, which was being used in constructing drains on the western end of the project. As large amounts of this and previous assessments remained unpaid the drainage work was handicapped, although urgently needed. The construction of the Black Canyon Dam in the Payette River was begun in July, 1922. This dam will divert water for canals of the Emmett irrigation district and will be available for diversion for lands of the Black Canyon irrigation district.

On the King Hill project, Idaho, the construction work covered by contract with the King Hill irrigation district was completed. The irrigation system, which has been entirely rebuilt to convey water to approximately 17,000 acres lying within the district boundary, was operated by the United States, under special contract with the district providing for operation of the completed works until November 1, 1923.

On the Minidoka project, Idaho, the Gravity division was operated under contract by an irrigation district. The Pumping division was operated by the Government. For many years the extension of the project by pumping onto a fine tract of land north and west of the Gravity division has been contemplated. This requires large storage facilities to provide the necessary water supply. A large number of the canal systems already in service under private and district management also require stored water to protect their lands in years of drought. Investigation of the reservoir site at American Falls demonstrated that it is of sufficient capacity to care for the needs of the Government and other lands. A plan of cooperation was worked out by which the operating companies will pay their share of the cost of constructing storage as the work progresses. Two irrigation districts have already made large payments; three other districts, one of them including five canal companies with 400,000 acres, have signed contracts. A contract has been negotiated with the Idaho Power Co. for the necessary portion of their conflicting rights at American Falls.

The Huntley project, Montana, was under operation by the United States, pending decision of the newly organized irrigation district to assume this work on behalf of the water users.

The Milk River project, Montana, is still on a rental basis. A board of review examined the project and made report in the fall of 1922, subsequent to which steps were taken looking to the formation of irrigation districts and making contracts between the districts and the United States. Current construction comprised the completion of Nelson Reservoir enlargement to a capacity of 66,800 acre-feet, some lateral extension work, and a small amount of drainage construction.

On the Sun River project, Montana, the Greenfields division lateral system was being extended to cover about 14,000 acres, making a total of 40,000 acres under constructed canals. Before further extensions are made, it will be necessary to enlarge the main canal and construct storage works. The construction of subsurface drains for the relief and protection of seeped and threatened areas was in progress and 5 miles of open drains had been completed. A section 1,700 feet long, where leaks and slides had given considerable trouble on the Greenfields Main Canal, was improved by placing a diaphragm of rag felt and tar between two 3-inch layers of reinforced concrete. The Fort Shaw division canal system was operated, but no construction work was in progress, and the water users had not completed arrangements necessary before beginning the construction of drainage works for the relief of about 2,500 acres of seeped land.

The Lower Yellowstone project is partly in Montana and partly in North Dakota. Construction was limited to lateral extensions and miscellaneous small structures, which work was practically completed. An extensive program of silt removal from the main canal by drag line was under way. Drainage is much needed.

The North Platte project is partly in Nebraska and partly in Wyoming. The Interstate division was being operated under public notice. The Fort Laramie division on the south side was practically completed through Wyoming and may be completed in Nebraska during 1925. During the year the Wyoming portion of the Fort Laramie division, about 50,000 irrigable acres, was organized into

an irrigation district, a large part of which was furnished water under rental contracts. The Nebraska portion, now under construction, was organized into an irrigation district in 1919 and contract entered into with the United States on May 25, 1920. The Northport division, occupying the most easterly portion of the north side irrigated area, was organized as a district in 1918, completed in 1922, and a part furnished water under rental contracts.

The Newlands project, Nevada, was operated under public notice for irrigation of lands in the Truckee and Carson divisions. Contemplated storage of Truckee River water in the proposed Spanish Springs Reservoir will provide water for extensions to include the Pyramid and Lovelock divisions and additional lands in the Truckee division. Surveys for right of way and other purposes in connection with this reservoir were in progress and right of way was being acquired. The Lahontan Reservoir, already built, serves Carson division lands. Excellent progress was made in constructing drains under a contract with the Truckee-Carson irrigation district.

The Carlsbad project, New Mexico, was operated under public notice. Investigations for the proposed extension of the project area were completed and report made in May, 1923. Field work looking to the adjudication of the waters of the Pecos River watershed was completed.

The Rio Grande project, New Mexico-Texas, was being operated pursuant to contracts with the Elephant Butte irrigation district for 83,000 acres of irrigable land in New Mexico, and with the El Paso County Water Improvement District No. 1 for 67,000 acres of irrigable land in Texas. In accordance with treaty provisions 60,000 acre-feet of water are supplied annually to lands in Mexico. During 1922 the first assessment of construction charges was collected, being 2 per cent on \$90 per acre on approximately 50,000 acres in the New Mexico portion of the project and 33,000 in the Texas portion. The storage and main diversion features were practically complete. A comprehensive system of deep drains was nearing completion, as well as the reconstruction and extension of the distribution system. The old community ditch systems were taken over and incorporated as far as practicable into the distribution system. Construction activities were equally divided between drainage and the distribution systems. The last project diversion, the Tornillo Canal heading, was constructed.

On the Williston project in North Dakota a power plant was being operated in connection with the irrigation of lands by pumping from the Missouri River. This development is still largely experimental, as the farmers have not yet demonstrated their ability to pay high pumping costs involved even when aided by sale of power for commercial purposes. An extension of the experiment was authorized by approval of a form of contract, extending repayment of costs and providing for equalization of the charges over a 10-year period.

The Umatilla project, Oregon, was operated by the Government. Contracts were being negotiated with the Stanfield irrigation district and the Westland irrigation district for a supplemental water supply to be furnished from the proposed McKay storage reservoir. Preparations were being made to acquire the site and begin construction of the dam, which is to be located 8 miles south of Pendleton.

The Klamath project, partly in Oregon and partly in California, was operated under public notice. Construction of the distribution system for about 10,000 acres uncovered in the Tule Lake area was completed, and public notice was issued, but afterwards suspended pending analysis of the announced construction charge. The Lost River diversion dam, and canals for irrigation of about 8,400 acres in the Langell Valley and Horsefly districts, with water from Clear Lake Reservoir, were under construction. Investigation of the Gerber, formerly known as the Horsefly, dam site on Miller Creek, was completed and negotiations for right of way required were in progress. The drainage system was extended to lands showing damage from seepage.

On the Belle Fourche project, South Dakota, important progress was made by the organization of the Belle Fourche irrigation district to replace the Belle Fourche Valley Water Users' Association. The district was declared organized on March 12, 1923, by order of the board of county commissioners of Butte County.

The Strawberry Valley project, Utah, has been completed. The water users' under irrigation districts and corporate organizations operate and maintain the canal and lateral systems and distribute water to the individual. The United States operates and maintains the storage works, power plant, and related works, and measures and delivers in bulk the project water supply to the headgates of the distributing canals. The irrigators were negotiating to take over the care, operation, and maintenance of the part of the irrigation works operated by the United States.

The Okanogan project, Washington, was operated under public notice. The project has suffered to a considerable extent from a shortage of water for several years past on account of light snow falls, in spite of which it holds the record for the highest acreage values produced on any project of the bureau. The reservoir capacity has been enlarged and pumping plants provided to increase the water supply.

The Yakima project, Washington, has been operated by the bureau for a number of years under public notice. In addition about 70,000 acres on the Yakima Indian Reservation are served with water from the reservoirs of the bureau, of which there are five in operation. A sixth, the Tieton Reservoir, is being constructed on the Tieton River. The Sunnyside division has been extended by the construction of the Granger siphon to irrigate about 1,600 acres of land in the Granger irrigation district. This siphon will be in operation beginning with the irrigation season of 1924. It is about 13,000 feet long and is built of 33-inch diameter reinforced concrete, lock-joint pipe. Investigations, surveys, and estimates have been completed for four new divisions, known as the Roza, Moxee, Kennewick, and Kittitas, comprising a total of 200,000 acres. All these divisions are organized as irrigation districts under the State law, and have made contracts with the United States for the purchase of their irrigation water supply.

The Riverton project, Wyoming, was under construction. The diversion dam and excavation of the upper portion of the main canal had been completed, and work was in progress on main canal structures.

The Shoshone project, Wyoming, as thus far constructed furnishes water to 71,000 acres under public notice on the Garland and Frannie divisions. Sixty per cent of this area was irrigated in 1922. The Willwood diversion dam had been practically completed and work was under way on the construction of the canal and lateral systems which will supply water to approximately 17,600 acres on the Willwood division. Most of this division is public land and will be opened to entry upon the completion of the construction work. Drainage work was being carried on under supplemental construction agreements on both the Garland and Frannie divisions.

The Blackfeet (Indian) project, Montana, was operated on a water-rental basis. On the Badger-Fisher division minor timber structures were placed on the lateral system. About 2 miles of Four Horns Reservoir outlet canal were excavated and on this canal 2 concrete drops and 4 minor timber structures were placed. Four divisions of the project were operated in 1922.

On the Flathead (Indian) project, Montana, construction work completed has provided the canal and lateral systems for the irrigation of 105,000 acres of land, but with incomplete storage, out of a total of 124,500 acres irrigable for the completed project. The work for the past year was principally on storage features, the principal works in course of construction being the Hubbard Dam to provide additional storage on the Little Bitterroot River for the Camas division; the Tabor feed canal to bring water from the Jocko River into Tabor Reservoir for the Mission Valley division, and the enlargement of the Ninepipe Reservoir to provide additional storage capacity for the lands of the Mission Valley division.

The Fort Peck (Indian) project, Montana, was operated in four units, Big Porcupine, Little Porcupine, Poplar, and Big Muddy, for a total of about 23,000 acres of irrigable land. Partial storage for the project has been secured in Big Porcupine, Little Porcupine, and Medicine Lake Reservoirs, amounting to a total of 17,620 acre-feet.



Washington:	8,000	5,570	4,840	1,607,140	332.00	151,170	134,860	124,360	9,042,150	73.00	63
Okanogan.....	101,340	95,000	80,760	6,309,920	78.13						
Yakima.....	32,000	28,700	26,400	2,625,880	94.80						
Sunnyside division.....											
Tieton division.....											
Wyoming:											
Shoshone.....	71,220	32,720	32,400	664,320	20.50						
Gardland division.....		10,060	9,420	124,100	12.96						
Franklin division.....											
Total.....	1,622,700	1,202,130	1,169,100	50,380,860	43.08	1,101,700	983,280	951,270	33,240,840	35.00	

<sup>1</sup> Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1921, to September, 1922.

<sup>2</sup> Areas Bureau of Reclamation was prepared to supply water.

<sup>3</sup> Irrigated crops. Excludes small areas on few projects cropped by dry farming.

<sup>4</sup> Data furnished by Salt River Valley Water Users' Association, which operates the project.

<sup>5</sup> Includes 5,536 acres reported as vacant, 3,032 acres of "home tracts," and 2,842 acres within town sites, on which no crops were reported.

<sup>6</sup> Data furnished by King Hill Irrigation district. The project was built under private auspices and is under reconstruction by the United States.

<sup>7</sup> Data furnished by Mindoka Irrigation district, which operated the division.

<sup>8</sup> Crop reports covered an additional area of 14,160 acres cropped by dry farming, producing crops worth \$138,640, or \$9.79 per acre.

<sup>9</sup> Figures are for 186 irrigated farms, which included small tracts farmed without irrigation.

<sup>10</sup> Crop reports covered an additional area of 13,290 acres cropped by dry farming, producing crops worth \$157,940, or \$11.88 per acre.

<sup>11</sup> For crops in full production, excluding 6,402 acres of wild-grass pasture and 1,118 acres otherwise not in full production. For all crops, \$43.03.

<sup>12</sup> Data not available; substantial area in Mexico is irrigated with water supplied from project works under treaty.

<sup>13</sup> Does not include portion of exposed Tule Lake bed temporarily leased and cropped with subirrigation, but not supplied with irrigation works.

<sup>14</sup> Owing to wet year only about half of land in crops received irrigation water.



Irrigation and crop results, Government reclamation projects, 1922.<sup>1</sup>

State and project.	Lands on projects proper covered by crop census.					Other lands served by Government works, usually a partial water supply through private canals under Warren Act contracts.				
	Irrigable acreage. <sup>2</sup>	Irrigated acreage. <sup>3</sup>	Cropped acreage. <sup>4</sup>	Crop value.		Irrigable acreage.	Irrigated acreage.	Cropped acreage.	Crop value.	
				Total.	Per acre.				Total.	Average per acre.
Arizona: Salt River <sup>4</sup> .....	213,170	203,330	191,920	\$12,886,050	\$67.20					
Arizona-California: Yuma.....	63,200	53,970	53,970	2,682,800	48.70		1,800	1,400	\$49,000	\$35.00
California: Orland.....	20,670	15,120	11,800	565,560	47.92					
Colorado:										
Grand Valley.....	30,000	12,370	11,840	365,760	30.88		8,350	7,800	600,000	77.00
Uncompahgre.....	67,410	64,730	61,700	1,550,900	28.14		600	550	20,580	37.40
Idaho:										
Boise.....	143,000	112,000	108,500	3,992,600	36.80		140,280	126,900	4,596,750	36.22
Kling Hill <sup>5</sup> .....	13,650	6,440	6,050	219,900	36.33		630,000	560,000	14,865,000	26.55
Mindoba.....	121,560									
Gravley division? <sup>6</sup> .....		60,300	57,520	1,563,310	27.18					
Pumping division.....		46,280	42,280	1,456,040	34.43					
Montana:										
Huntley.....	32,000	19,520	19,520	572,700	29.33					
Milk River <sup>4</sup> .....	66,500	18,170	18,150	202,110	11.14		33,909	25,000	388,460	15.50
Sun River.....	42,470									
Fort Shaw division.....		8,110	7,470	114,840	15.38					
Greenfields division? <sup>7</sup> .....		12,420	15,800	265,850	16.82					
stone <sup>8</sup> .....										
Lower Yellow.....	40,200	15,600	15,400	334,100	21.68					
Montana-North Dakota: Lower Yellow- stone <sup>9</sup> .....										
Nebraska:										
North Platte.....	162,240	87,300	86,400	1,878,450	21.74		122,400	98,800	3,482,300	36.59
Interstate division.....		20,300	20,100	312,040	15.42					
Fort Laramie division.....		3,650	3,450	72,520	21.05					
Northport division.....		44,900	42,300	1,840,710	43.30					
Nevada: Newlands.....	73,750	24,080	22,430	1,197,980	53.41					
New Mexico: Carlsbad.....	25,000	89,590	84,410	4,476,670	53.06		(13)			
New Mexico-Texas: Rio Grande.....	116,000	1,570	1,230	62,280	53.26					
North Dakota: Williston.....	7,650	13,270	12,300	486,200	39.24					
Oregon: Umatilla.....	24,590	36,000	32,950	537,140	16.30		10,000	9,000	184,360	20.00
Oregon-California: Klamath.....	81,000	32,160	56,920	586,770	10.29					
South Dakota: Belle Fourche.....	52,190									
Utah: Strawberry Valley.....	53,890	30,520	30,340	997,550	30.00		1,000	890	12,300	15.00

Washington:	5,000	5,570	4,840	1,007,140	332.00	151,170	124,860	124,360	9,043,150	75.00	63
Okanogan	101,340	95,000	80,760	6,330,920	78.13						
Yakima	32,000	28,700	26,400	2,023,880	84.80						
Sunnyside division											
Tieton division											
Wyoming:											
Shoshone	71,220										
Garland division		32,720	32,400	644,320	20.50						
Franklin division		10,060	9,420	122,100	12.96						
Total	1,662,700	1,202,130	1,169,100	50,360,860	43.08	1,101,700	983,290	951,270	33,240,840	35.00	

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3 Irrigated crops. Excludes small areas on few projects cropped by dry farming.

4 Data furnished by Salt River Valley Water Users' Association, which operates the project.

5 Includes 5,530 acres reported as vacant, 3,032 acres of "home tracts," and 2,842 acres within town sites, on which no crops were reported.

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12 Data not available; substantial area in Mexico is irrigated with water supplied from project works under treaty.

13 Does not include portion of exposed Tule Lake bed temporarily leased and cropped with subirrigation, but not supplied with irrigation works.

14 Owing to wet year only about half of land in crops received irrigation water.

*Summary of crop reports on reclamation projects in 1922.*

NOTE.—These figures are limited to irrigated crops covered by crop census on Government projects proper, excluding dry-farm crops and all crops in most areas served stored water under the Warren Act.

Crop.	Acreage cropped.		Yields.			Crop value.		
	Total.	Per cent of cropped acreage, all crops.	Unit.	Total.	Average per acre.	Average per acre.	Total.	Per cent of total value of all crops.
<b>Cereals:</b>								
Barley.....	32,272	2.8	Bushels...	1,044,294	32	\$19.06	\$615,263	1.2
Corn.....	53,732	4.6	..do.....	1,511,781	28	18.70	897,595	1.8
Oats.....	42,080	3.6	..do.....	1,231,553	29	14.86	624,751	1.2
Rye.....	1,263	.1	..do.....	12,990	10	6	7,369	.....
Wheat.....	159,573	13.6	..do.....	3,790,734	24	21.41	3,417,624	6.8
<b>Total.....</b>	<b>288,870</b>	<b>24.7</b>		<b>7,591,352</b>	<b>26</b>	<b>19.26</b>	<b>5,562,602</b>	<b>11</b>
<b>Other grain and seed:</b>								
Alfalfa seed.....	21,557	1.9	Bushels...	70,196	3.2	28.72	619,229	1.2
Clover seed.....	9,657	.8	..do.....	47,191	5	39.50	384,485	.8
Grain sorghum.....	22,795	1.9	..do.....	816,675	36	25.60	583,343	1.2
Flaxseed.....	290	.....	..do.....	1,521	5.3	10.40	3,006	.....
Millet seed.....	87	.....	..do.....	1,011	11.62	15.17	1,320	.....
<b>Total.....</b>	<b>54,386</b>	<b>4.6</b>		<b>935,594</b>	<b>17.20</b>	<b>29.20</b>	<b>1,588,383</b>	<b>3.2</b>
<b>Hay and forage:</b>								
Alfalfa hay.....	448,446	38.4	Tons.....	1,343,730	3	32.30	14,486,634	28.8
Clover hay.....	10,770	.9	..do.....	18,189	1.7	12.17	131,074	.3
Other hay.....	22,180	1.9	..do.....	27,057	1.2	10.49	232,657	.5
Corn fodder.....	4,120	.4	..do.....	15,278	3.7	16.71	68,866	.1
Other forage.....	3,713	.3	..do.....	18,640	5	32.07	119,095	.2
Pasture.....	107,203	9.1	.....	.....	.....	10.98	1,176,693	2.3
<b>Total.....</b>	<b>596,432</b>	<b>51</b>				<b>27.20</b>	<b>16,215,019</b>	<b>32.2</b>
<b>Vegetables and truck:</b>								
Beans.....	4,102	.4	Bushels...	58,589	14	44.76	203,610	.4
Onions.....	1,502	.1	..do.....	396,397	257	113	160,648	.3
Potatoes, white.....	78,507	6.7	..do.....	15,295,941	195	46	3,596,624	7.1
Potatoes, sweet.....	856	.....	..do.....	113,440	133	142	121,358	.2
Truck.....	23,510	2	.....	.....	.....	125.70	2,655,304	6
<b>Total.....</b>	<b>106,477</b>	<b>9.2</b>				<b>65</b>	<b>7,046,544</b>	<b>14</b>
<b>Fruits and nuts:</b>								
Apples.....	26,747	2.3	Pounds...	228,695,670	8,550	187	5,008,788	10
Peaches.....	1,997	.1	..do.....	19,243,950	9,636	209	399,436	.8
Pears.....	4,201	.4	..do.....	18,639,370	4,437	98	409,559	.8
Prunes.....	1,236	.1	..do.....	9,051,909	7,324	132	163,324	.3
Citrus fruits.....	2,278	.2	..do.....	14,972,000	6,572	328	745,540	1.5
Small fruit.....	2,156	.2	..do.....	11,832,720	5,490	308	664,545	1.3
Miscellaneous.....	2,901	.3	..do.....	6,551,360	2,258	108	312,945	.6
<b>Total.....</b>	<b>41,516</b>	<b>3.6</b>		<b>308,986,970</b>	<b>7,442</b>	<b>185</b>	<b>7,704,137</b>	<b>15.3</b>
<b>Miscellaneous:</b>								
Sugar beets.....	29,654	2.6	Tons.....	346,627	11.7	75	2,223,628	4.4
Cotton.....	147,340	12.6	Pounds...	13,474,500	91.5	67	9,743,728	19.3
Cottonseed.....				87,211,180	592			
Cane.....	2,636	.2	Tons.....	6,696	2.5	27.70	73,030	.1
Other crops.....	6,415	.6	.....	.....	.....	31.76	203,779	.5
<b>Total.....</b>	<b>186,045</b>	<b>16</b>				<b>65.81</b>	<b>12,244,165</b>	<b>24.3</b>
Duplication.....	106,636	9.1						
All crops.....	1,169,100	100.0				<b>43.08</b>	<b>50,360,850</b>	<b>100.0</b>

*Settlement data, Bureau of Reclamation projects, 1922.*

State and project.	Farms.		Towns.		Number of schools.
	Number.	Population.	Number.	Population.	
Arizona: Salt River.....	5,000	36,000	14	44,000	60
Arizona-California: Yuma.....	1,216	4,200	6	6,700	20
California: Orland.....	968	2,275	1	1,700	10
Colorado:					
Grand Valley.....	387	1,134	6	11,246	24
Uncompahgre.....	1,624	6,149	3	7,450	27
Idaho:					
Boise.....	3,559	14,236	8	36,170	28
King Hill.....	175	599	4	2,052	6
Minidoka.....	2,451	8,301	6	8,170	22
Montana:					
Huntley.....	590	1,682	8	673	8
Milk River.....	209	651	15	7,100	38
Sun River.....	393	978	4	401	17
Montana-North Dakota: Lower Yellowstone.....	575	1,591	8	2,805	13
Nebraska-Wyoming: North Platte.....	1,710	5,682	22	20,800	67
Nevada: Newlands.....	778	2,450	5	2,500	11
New Mexico: Carlsbad.....	333	1,580	4	3,440	10
New Mexico-Texas: Rio Grande.....	3,534	11,267	34	110,442	49
North Dakota: Williston.....	73	212	2	4,500	6
Oregon: Umatilla.....	558	1,613	4	1,280	6
Oregon-California: Klamath.....	570	2,200	5	6,200	22
South Dakota: Belle Fourche.....	1,035	2,213	5	2,336	24
Utah: Strawberry Valley.....	2,741	6,500	12	16,000	23
Washington:					
Okanogan.....	445	1,363	3	2,300	6
Yakima-Sunnyside.....	3,138	12,332	11	7,250	41
Tieton.....	1,300	3,542	8	23,000	10
Wyoming:					
Riverton.....			2	2,500	2
Shoshone.....	914	2,444	5	1,585	7
<b>Total.....</b>	<b>34,276</b>	<b>131,194</b>	<b>205</b>	<b>332,650</b>	<b>557</b>

State and project.	Number of churches.	Banks.			
		Number.	Capital stock.	Deposits.	Number of depositors.
Arizona: Salt River.....	65	20	\$1,755,500	\$21,331,600	39,500
Arizona-California: Yuma.....	24	5	280,000	3,095,400	6,382
California: Orland.....	7	2	171,000	995,000	2,900
Colorado:					
Grand Valley.....	28	7	468,700	3,520,500	8,834
Uncompahgre.....	27	7	550,100	2,980,700	11,250
Idaho:					
Boise.....	56	16	2,741,000	16,707,000	30,000
King Hill.....	5	1	20,000	275,000	800
Minidoka.....	29	5	180,000	1,100,000	5,000
Montana:					
Huntley.....	7	2	50,000	155,000	810
Milk River.....	25	23	843,000	4,350,000	12,000
Sun River.....	11	3	71,500	158,000	740
Montana-North Dakota: Lower Yellowstone.....	15	7	200,000	1,425,000	4,475
Nebraska-Wyoming: North Platte.....	47	26	810,000	6,579,600	1,160
Nevada: Newlands.....	8	1	75,000	680,700	1,700
New Mexico: Carlsbad.....	12	3	225,000	1,106,300	2,374
New Mexico-Texas: Rio Grande.....	110	13	2,950,000	30,000,000	31,000
North Dakota: Williston.....	7	2	185,000	1,700,000	3,500
Oregon: Umatilla.....	9	1	25,000	300,000	1,200
Oregon-California: Klamath.....	10	5	255,000	3,500,000	8,000
South Dakota: Belle Fourche.....	9	9	250,000	2,608,200	6,800
Utah: Strawberry Valley.....	25	6	285,000	1,900,000	10,000
Washington:					
Okanogan.....	8	5	155,000	958,000	2,250
Yakima-Sunnyside.....	30	12	400,000	3,600,000	12,000
Tieton.....	4				
Wyoming:					
Riverton.....	7	5	135,000	1,000,000	2,300
Shoshone.....	8	4	100,000	441,000	2,400
<b>Total.....</b>	<b>593</b>	<b>190</b>	<b>13,180,800</b>	<b>109,804,400</b>	<b>208,968</b>

## SUMMARY OF CONSTRUCTION RESULTS, JUNE 30, 1923.

Items.	To June 30, 1923.		To June 30, 1922.		Increase.	
Reservoir capacity available (original).....	Acro.-feet. 10,033,608		Acro.-feet. 9,679,798		Acro.-feet. 353,800	
CANALS DITCHES AND DRAINS.						
	Miles.		Miles.		Miles.	
Canals over 800 second-feet capacity.....	511		506		5	
Canals 301 to 800 second-feet capacity.....	656		678		22	
Canals 50 to 300 second-feet capacity.....	2,185		2,086		99	
Canals less than 50 second-feet capacity.....	8,729		8,310		419	
Total canals.....	12,111		11,590		521	
Waste-water ditches.....	931		809		122	
Drains, open.....	1,236		1,015		221	
Drains, closed.....	196		199		3	
Total.....	2,363		2,013		350	
Grand total.....	14,474		13,593		881	
TUNNELS.						
Number.....	103		101		2	
Length (feet).....	145,810		145,436		374	
STORAGE AND DIVERSION DAMS.						
	Cubic yards.		Cubic yards.		Cubic yards.	
Masonry.....	2,151,361		2,102,463		48,898	
Earth.....	11,935,701		11,102,524		833,177	
Rockfill and crib.....	1,416,133		1,285,590		130,544	
Total.....	15,503,195		14,490,576		1,012,619	
DIKES AND LEVEES.						
Length and volume.....	Feet. 757,305	Cu. yds. 5,002,681	Feet. 649,397	Cu. yds. 4,719,186	Feet. 107,908	Cu. yds. 253,466
	Concrete.	Wood.	Concrete.	Wood.	Concrete.	Wood.
CANAL STRUCTURES.						
	Number.	Number.	Number.	Number.	Number.	Number.
Costing over \$2,000.....	1,305	218	1,207	209	98	9
Costing \$500 to \$2,000.....	2,874	899	2,675	762	199	107
Costing \$100 to \$500.....	14,120	8,968	12,705	7,826	1,415	1,142
Costing less than \$100.....	25,524	71,624	23,186	68,887	2,338	2,737
Total.....	43,823	81,679	39,773	77,684	4,050	3,995
Grand total.....	125,502		117,457		8,045	
	Number.	Length.	Number.	Length.	Number.	Length.
BRIDGES.						
		Feet.		Feet.		Feet.
Steel.....	108	8,864	106	8,664	2	200
Combination.....	414	12,542	414	12,542	.....	.....
Wood.....	8,217	190,438	7,888	168,112	829	22,326
Concrete.....	354	4,838	352	4,064	2	174
Total.....	9,093	216,682	8,260	193,982	833	22,700
CULVERTS.						
Concrete.....	2,758	135,267	2,422	119,777	336	15,490
Metal.....	2,165	75,461	2,013	70,030	152	5,431
Terra cotta.....	1,901	76,777	1,705	69,537	196	7,240
Wood.....	4,189	101,801	4,189	101,801	.....	.....
Total.....	11,013	389,306	10,329	361,145	684	28,161
PIPE.						
	Linear feet.		Linear feet.		Linear feet.	
Concrete.....	806,851		770,823		36,028	
Metal.....	275,027		272,810		2,217	
Terra cotta (tile).....	1,472,784		1,428,261		44,523	
Wood.....	602,136		532,240		69,896	
Total.....	3,156,798		3,004,134		152,664	

## Summary of construction results, June 30, 1923—Continued.

Items.	To June 30, 1923.		To June 30, 1922.		Increase.	
	Number.	Length.	Number.	Length.	Number.	Length.
PLUMES.						
Concrete.....	99	<i>Feet.</i> 66,294	98	<i>Feet.</i> 65,121	1	<i>Feet.</i> 1,173
Metal.....	1,280	196,991	1,148	185,067	112	11,924
Wood.....	2,455	482,890	2,419	477,258	36	5,632
Total.....	3,814	746,175	3,665	727,446	149	18,729
CANALS LINED.						
	Concrete.	Wood.	Concrete.	Wood.	Concrete.	Wood.
Length (miles).....	394.20	4.12	378.50	4.12	15.70	.....
Total.....	398.32		382.62		15.70	
BUILDINGS.						
	<i>Number.</i>		<i>Number.</i>		<i>Number.</i>	
Offices.....	99		99		0	
Residences.....	715		715		0	
Power plants.....	31		31		0	
Pumping stations.....	167		165		2	
Barns, storehouses, etc.....	561		561		0	
Total.....	1,573		1,571		2	
WELLS.						
	Number.	Depth.	Number.	Depth.	Number.	Depth.
Number and depth.....	585	<i>Feet.</i> 58,028	556	<i>Feet.</i> 52,821	29	<i>Feet.</i> 5,207
COMMUNICATIONS.						
	<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>	
Roads.....	1,038		1,038		.....	
Railroads.....	83		83		.....	
Telephone lines.....	3,284		3,284		.....	
Transmission lines.....	1,157		841		316	
Total.....	5,562		5,246		316	
POWER DEVELOPED.						
Water and steam horsepower.....	64,159		63,973		186	
EXCAVATION.						
	<i>Cubic yards.</i>		<i>Cubic yards.</i>		<i>Cubic yards.</i>	
Class 1, earth.....	194,715,455		180,226,211		14,489,244	
Class 2, indurated material.....	11,819,395		11,248,063		571,332	
Class 3, rock.....	9,484,994		9,103,256		381,739	
Total.....	216,019,844		200,577,519		15,442,325	
RIPRAP (cubic yards).....	2,288,946		2,280,756		8,190	
PAVING (square yards).....	938,442		924,674		13,768	
CONCRETE (cubic yards).....	3,270,895		3,168,403		102,492	
CEMENT (barrels).....	3,307,152		3,181,121		126,031	

## DRAINAGE.

*Estimate of seepage and summary of drainage work to June 30, 1923.*

State and project.	Constructed drains. <sup>1</sup>		Estimated area damaged by seepage on June 30, 1923.	Estimated area protected by constructed drains.	Estimated area that will be protected when all drains authorized have been constructed.
	Open.	Closed.			
	Miles.	Miles.	Acres.	Acres.	Acres.
Arizona: Salt River <sup>2</sup> .....	11.70	4.00		8,000	8,000
Arizona-California:					
Yuma—					
Reservation.....	11.70	4.00		8,000	8,000
Yuma Valley.....	33.80			30,000	50,000
Colorado:					
Grand Valley—					
Project lands.....	22.87		600	3,600	4,780
Grand Valley drainage district.....	33.80	1.00	20,000	10,000	10,000
Teiler Institute.....	2.80			800	800
Frey drain.....	1.60			800	800
Uncompahgre <sup>3</sup> .....		94.00	16,200	9,200	9,200
Idaho:					
Boise—					
Riverside irrigation district.....	44.10		350	11,400	11,400
Pioneer irrigation district.....	78.50	.40	300	30,000	30,000
Nampa-Meridian irrigation district.....	45.76		400	51,000	51,000
Other parts.....	18.62	.10	5,000	6,000	10,000
King Hill <sup>4</sup> .....	.88			800	800
Mindoka (Gravity division).....	100.00		1,000	30,000	30,000
Montana:					
Flathead (Indian).....	.18	2.97	640	1,240	1,240
Huntley.....	16.73	50.50	1,300	21,500	21,500
Milk River—					
Malta division.....	2.0		2,300	100	130
Glasgow division.....			200		
Sun River—					
Fort Shaw division.....			2,571		
Greenfields division.....	5.10		1,200	1,840	7,000
Montana-North Dakota: Lower Yellowstone.....	4.50	1.10	1,800	1,600	1,600
Nebraska-Wyoming:					
North Platte—					
Interstate division.....	30.13	14.60	2,800	5,400	8,200
Interstate division <sup>5</sup> .....	43.26				
Fort Laramie division.....	56.21		680	200	16,000
Northport division.....	5.81		40	1,800	1,500
Nevada:					
Newlands—					
Carson division.....	125.92	3.99	10,000	54,150	88,483
Truckee division.....	11.59		200	3,707	13,940
New Mexico: Carlisbad.....	11.14	3.65	5,800	5,081	5,081
New Mexico-Texas:					
Rio Grande—					
Rincon division.....	8.30		8,000	4,000	17,000
Leasburg division.....	60.30		1,500	29,000	31,000
Mesilla division <sup>6</sup> .....	112.60		1,500	45,000	47,000
El Paso division <sup>6</sup> .....	101.40		6,000	45,000	55,000
Oregon:					
Umatilla.....	10.00		400	2,000	2,000
Klamath.....	103.00	8.00	2,000	28,700	30,000
South Dakota: Belle Fourche.....			4,133		
Utah: Strawberry Valley <sup>7</sup> .....	18.90	71.50	8,500	11,422	19,922
Washington:					
Yakima—					
Sunnyside division <sup>7</sup> .....	82.85	95.07	10,000	50,357	50,357
Tieton division <sup>7</sup> .....	7.50	2.30	200	2,400	2,400
Wyoming:					
Shoshone—					
South Garland division.....	29.55	92.30	1,300	18,000	26,000
North Garland division.....	37.93	2.27	3,000	6,500	12,000
West Garland division.....	1.02	1.24		500	500
Framie division.....	44.03		3,500	6,000	22,000
Total.....	1,337.38	448.99	132,084	535,807	665,563

<sup>1</sup> Surface drains and waste ditches not included.<sup>2</sup> Pumping and drainage plants have produced marked effect in lowering water table in certain areas.<sup>3</sup> Constructed by landowners, water users, or drainage districts.<sup>4</sup> Outlet channels, of which 7.74 miles were built by the United States as a part of the project drainage, 17.35 miles by the United States under cooperative contracts, 16.17 miles by the Farmers' irrigation district, and 2 miles by the Morrill drainage district.<sup>5</sup> Includes 1.7 miles of temporary outlet abandoned.<sup>6</sup> Includes 0.4 miles of temporary outlet to be abandoned.<sup>7</sup> All drainage work done by county drainage engineer through drainage improvement districts.<sup>8</sup> Area benefited.

# POWER AND PUMPING.

Power plants operated on Bureau of Reclamation projects during the fiscal year 1922-23.

## POWER AND PUMPING.

17

Project.	Name of plant.	Type of plant.	Station capacity.	Number of units.	Head.	First cost of plant.	Cost of operation.	Estimated depreciation.	Cost per kilowatt-hour, exclusive of depreciation.	Output.	Distribution of power generated (kilowatt-hours).				Gross power sales.
											Sold to consumers.	Used for irrigation purposes.	Used for other purposes.	Losses.	
Bates.	Bates.	Hydroelectric.	1,875	2	30.0	\$148,925.27	\$9,092.09	\$540.00	0.017317	5,092,898	5,031,407		52,531		\$11,000.00
Minidoka.	Minidoka.	do.	1,000	5	42.21	148,317.40	19,933.59	5,012.00	0.03546	4,945,994	20,369,323	22,474,533	712,729	442,499	121,055.35
Newlands.	Newlands.	do.	1,875	5	110	141,888.01	9,391.23	5,673.44	0.03671	7,533,730	7,304,059		22,744		23,323.72
Williston.	Williston.	Steam electric.	1,150	4		173,000.00	66,733.95	3,000.00	0.04234	1,149,736	1,122,178	316,383	468,431	102,775	73,431.56
North Platte.	North Platte.	Hydroelectric.	780	2	106	93,963.20	24,191.15	1,950.00	0.04926	2,539,730	947,015		1,125,460	467,255	25,953.59
Orogrande.	Power Plant No. 1. <sup>1</sup>	do.	187	1	108	11,923.44									
Orogrande.	Power Plant No. 2. <sup>2</sup>	do.	187	1	35	13,831.42									
Orogrande.	Elephant Butte No. 2.	do.	187	1	147.55	3,440.50	1,890.20	1,638.10	0.0874	19,418			19,418		
Salt River.	Arizona Falls.	do.	950	2	19	109,800.73	8,923.55	5,475.00		3,029,900					
Salt River.	Chandler.	do.	600	1	40	81,990.84	11,174.30	5,600.00		3,347,450					
Salt River.	Crescent.	do.	5,250	6	111	753,147.29	31,385.71	7,537.00		13,333,203	367,013,260	13,482,157	2,038,810	7,045,733	567,641.74
Shoshone.	Roosevelt.	Hydroelectric.	11,750	6	80-235	700,317.94	62,919.39	43,516.00		89,276,550					
Shoshone.	South Consolidated.	do.	1,600	2	23	163,130.60	10,070.91	8,157.00		4,274,100					
Shoshone.	Shoshone.	do.	2,000	2	120-230	564,928.00	10,540.00	13,519.00	0.068	1,817,200	150,270		1,040,434	628,526	5,701.01
Shoshone.	Spanish Fork.	do.	1,000	2	123.5	60,724.00	15,948.04	3,083.72	0.1363	1,391,249	1,177,968		161,451	61,805	23,961.59
Yakima Storage Valley.	Tieton No. 1. <sup>3</sup>	do.	270	2	45	40,000.00		11,510.88		40,000.00					
Yakima Storage Valley.	Tieton No. 2. <sup>4</sup>	do.	1,000	2	74	76,753.16	12,461.71	33,496.32	0.0330	3,895,800			3,784,800	111,000	
Yakima-Sunny-side.	Rocky Ford. <sup>5</sup>	do.	187	1	73	23,000.00	1,765.35	1,056.00	0.0222	785,500			785,500		

<sup>1</sup> Canal maintenance only. Balance of operation and maintenance paid by lessees, the Canyon Power Co.

<sup>2</sup> Not operated during fiscal year 1922-23.

<sup>3</sup> All five plants supply the same distributing system.

<sup>4</sup> Book value at present, \$1,839.65.

<sup>5</sup> This amount includes cost of transmission lines and transformers to value of \$9,000.

<sup>6</sup> Operated and maintained by Grand view irrigation district.



Pumping plants operated on Bureau of Reclamation projects during fiscal year 1922-23.

Project.	Name of plant.	Type of pumping unit.	Plant capacity.	Number of units.	Net lift.	First cost of plant.	Cost of operation.	Estimated depreciation.	Energy used for pumping.	Acres-foot pumped.	Cost per acre-foot without depreciation.	
											Per acre-foot.	Per foot lift.
Grand Valley	Price Stub 1.	V. T. D. C.	126	1	31	\$46,697.83	\$780.23	\$1,000.00		6,539	80.12	80.00387
	Ballantine	do.	400	2	45	73,833.32	3,498.87	2,000.00	(1)	11,275	.31	.00389
	Ballantine auxiliary	O. E. D. C.	630	2	45	71,103.56	2,762.60	5,000.00		1,761	1.57	.00489
	A-4 Raise 1.	Scoop wheel.	25	1	3.5	3,338.42		249.03	34,113			
	Pumping station No. 1.	V. M. D. C.	2,760	5	28.2	185,020.06			8,799,847	186,445		
Mindoko	Pumping station No. 2.	do.	2,400	4	30.2	124,924.00			13,674,646	160,350		
	Pumping station No. 3.	do.	1,660	3	28.9	103,106.96				99,188		
	Boersch Lake 1.	do.	200	2	19.8	32,947.72			442,950		0.0438	0.00049
Williston	C-2 pumping station.	H. M. D. C.	7.5	1	7	2,893.97		182.26	9,331			
	114 pumping station 1.	do.	5.0	1	4	1,095.76		65.57	5,866			
	1812 pumping station 1.	Scoop wheel.	10.0	1	4.8	3,634.71		272.62	8,992			
	West End pumping station 1.	H. M. D. C.	150	2	21.25	18,745.61		817.80	413,800			
	Pumping station No. 1.	S. T. D. C.	450	2	56	8,800.00		300.00	86,429			
North Platte	Pumping station No. 2.	H. M. D. C.	175	2	26.6	2,947.46	6,975.83	800.00	54,830	888	8.32	.14867
	Pumping station No. 3.	do.	406	3	33	39,647.00	2,947.46	800.00	194,703	465	5.95	.2236
	Pumping station No. 4.	do.	100	1	27.25	8,821.00	10,875.22	1,000.00	36,554	1,535.86	7.08	.22126
	Pumping station No. 1.	V. M. D. C.	80	1	53	11,249.27	1,644.12	500.00		281	2.82	.18394
	Dutch Flat Drain No. 2.	do.	20	1	30	11,249.27	1,644.12	500.00		454	3.71	.12789
Okanogan	Dutch Flat Drain No. 3.	do.	20	1	47	11,249.27	1,644.12	500.00		173	5.81	.12961
	Duck Lake (old).	H. M. D. C.	50	1	55	12,981.24	3,040.38		98,984	1,150	2.65	.04818
	Duck Lake (new).	do.	30	2	35	18,598.21	1,830.81		60,967	370	4.95	.14143
Salt River	Government wells Nos. 1 and 2.	V. M. D. C.	200	2	188	30,077.24	11,249.48		60,141	1,331.2	8.53	.04837
	Robinson Flat 1.	G. E. D. C.	275	2	10-20	17,842.16	15,370.86			2,789.9	6.74	.40683
	Salmon Lake.	(10 V. M. D. C.)	765	11	35.91	146,094.21	8,914.48	10,365.89	2,209,436	26,656	.334	.0093
	Chandler division.	(1 H. M. D. C.)	900	4	47	91,088.90	14,093.00	4,531.94	3,847,696	33,885	.416	.00885
	Mass division.	V. M. D. C.	600	16	22.42	145,047.84	7,033.06	10,153.35	1,590,983	26,098	.77	.01204
Salt River	Phoenix division.	do.	345	18	57.20	133,791.11	10,848.98	9,245.38	1,904,243	12,447	.88	.01894
	Salt River division.	do.	760	21	28.03	169,318.26	17,009.07	11,862.28	2,997,274	44,031	.386	.0133
	San Francisco.	H. M. D. C.	100	1	38	29,975.98	17,943.57	2,997.90	1,236	1,236	.441	.0116
	Tolleon division.	V. M. D. C.	650	20	35.07	168,360.75	15,201.87	11,785.25	2,663,000	83,311	.456	.019

Yakima Sunny-side.	Grand View <sup>1</sup> .	V. T. D. C. H. M. D. C.	3	35-75	75, 800.00	94,468.46	3,120.00	14,079	.317	.00661
	Hillcrest <sup>12</sup>	V. T. D. C.	1	103	4,800.00	130.63	300.00	359	.363	.00352
	Little Snipes Mountain <sup>12</sup>	H. T. D. C.	1	60	1,162.00	37.23	45.00	75	.363	.00726
	Outlook <sup>12</sup>	V. T. D. C.	2	110	92,000.00	3,470.71	2,450.00	16,330	.312	.00193
	Prosser <sup>12</sup>	H. T. D. C.	1	105	31,963.00	1,386.75	1,500.00	3,510	.366	.00376
	Snipes Mountain <sup>12</sup>	V. T. D. C.	2	200	48,500.00	2,498.53	1,800.00	6,883	.363	.00192
	Spring Creek <sup>12</sup>	H. T. D. C.	1	90	28,080.00	1,261.74	1,500.00	3,708	.34	.00388
Yuma	"B" Lift.....	V. M. D. C.	1	69	159,524.11	22,584.53	400.00	665,100	4.72	.169
	Reservation.....	O. E. D. C.	2	4.5	6,775.60	1,664.74	600.00	1,800	.92	.22
	Valley drainage.....	O. E. D. C.	3	9.88	191,906.91	12,786.39	2,000.00	37,966	.86	.096
Lower Yellow-stone.	West Yuma pumping.....	G. E. D. C.	1	7	1,318.09	1,318.09	100.00	1,120	10.98	1.87
	Thomas Point <sup>12</sup> .....	H. T. D. C.	2	31	49,837.72	1,41.75	500.00	1,750	14.06	.001906

<sup>1</sup> Type V. M. D. C.—Vertical motor driven centrifugal pump. H. M. D. C.—Horizontal motor driven centrifugal pump. S. T. D. C.—Steam turbine driven centrifugal pump. V. T. D. C.—Vertical hydraulic turbine driven centrifugal pump. H. T. D. C.—Horizontal hydraulic turbine driven centrifugal pump. O. E. D. C.—Oil engine driven centrifugal pump. O. E. D. C.—Oil engine driven centrifugal pump.

<sup>2</sup> Water power.

<sup>3</sup> Operated by Minidoka Irrigation district.

<sup>4</sup> Total for three south side stations.

<sup>5</sup> Average for all three stations.

<sup>6</sup> Power supplied by Washington Water Power Co.

<sup>7</sup> Operated by Grandview Irrigation district.

<sup>8</sup> Includes O. and M. east of Rocky Ford Power Plant.

<sup>9</sup> Operated by Snipes Mountain Irrigation district.

<sup>10</sup> Operated by Outlook Irrigation district.

<sup>11</sup> Operated by Prosser Irrigation district.

<sup>12</sup> Operated first on July 13, 1922.

<sup>13</sup> Based on 1923 operation.

## Principal contracts for sale of power in force June 30, 1923.

Project.	Name of contractor.	Date of contract.	Date of expiration.	Maximum load.	Rate per kilowatt hour.	Gross income fiscal year 1922-23.	Remarks.
Bode.	Idaho Power Co.	Apr. 1, 1923	Mar. 31, 1928	Kilowatts. ‡ P. P. capacity.	.....	\$11,000.00	
Mindoka.	Amalgamated Sugar Co.	May 1, 1922	Feb. 28, 1928	7-67	Mindoka standard.	1,283.01	
	City of Butley.	Jan. 15, 1920	Jan. 1, 1930	200-3000	do.	50,851.86	
	City of Rupert.	Jan. 15, 1920	Jan. 1, 1930	180-2000	do.	24,528.00	
	East End Electric Co.	Jan. 23, 1918	Jan. 21, 1923	18	do.	1,028.94	
	Ferry Light & Power Co.	Mar. 12, 1919	Mar. 12, 1929	18	do.	1,028.92	
	Mindoka irr'n district.	Dec. 2, 1916	Feb. 12, 1924	Reg. of irr'g. 100-500	\$0.003 Mindoka standard.	2,743.17	For heat, 75 cents per kilowatt month first 50 kilowatts.
	Paul Electric Co.	Feb. 1, 1920	Feb. 12, 1924	11-15	do.	2,076.33	Minimum monthly payment \$40.
	Rural Electric Co.	Mar. 19, 1917	Mar. 31, 1927	30-41	do.	1,731.93	Power.
	Unity Light & Power Co.	Mar. 19, 1917	Mar. 19, 1927	30-41	do.	2,680.55	Heat.
	Village of Albion.	Oct. 15, 1915	Jan. 8, 1928	30-100	do.	5,528.34	
	Do.	Sept. 18, 1916	Jan. 8, 1928	200	\$1.25 per kilowatt-month.	2,208.17	
	Village of Deelo.	Oct. 28, 1920	Nov. 1, 1930	30-41	Mindoka standard	1,781.20	
	Village of Heyburn.	Mar. 9, 1920	Jan. 1, 1930	50-200	do.	1,786.11	
	56 small contracts.			115.5	do.	6,206.41	Each less than \$1,000 annual revenue.
Newlands.	Canon Power Co.	July 10, 1914	Nov. 30, 1924	1500	‡ to ‡ cents per kilowatt-hour	23,152.55	Minimum monthly payment \$1,200.
Williston.	City of Williston, N. Dak.	Sept. 25, 1922	Sept. 25, 1932	600	2 cents to 5 cents.	49,570.46	
North Platte.	City of Mitchell, Nebr.	May 5, 1922	Apr. 30, 1924	135	North Platte standard.	11,108.45	
	City of Torrington, Wyo.	May 10, 1921	May 9, 1923	125	do.	10,281.41	
	Platte Valley Power Co.	May 1, 1922	June 21, 1929	25	do.	1,944.74	
	Security Land Co.	Feb. 9, 1922	Mar. 1, 1927	25	do.	1,528.33	
	Village of Lingle, Wyo.	Jan. 19, 1922	Oct. 26, 1924	25	do.	1,713.98	
	Village of Morrill, Nebr.	May 2, 1922	Apr. 30, 1924	55	do.	4,127.08	
Salt River.	City of Powell, Wyo.	Sept. 21, 1921	Oct. 1, 1923	100	Shoshone standard.	5,006.23	
Shoshone.	Castilla Hot Springs Co.	Sept. 6, 1919	Sept. 6, 1924	10	Strawberry Valley standard.	158.30	Minimum monthly payment \$15.
Strawberry Valley.	Payson City.	Feb. 3, 1922	Feb. 5, 1925	120	do.	9,597.48	
	Salmon City.	Feb. 3, 1922	Feb. 5, 1925	40	do.	2,466.13	
	Spanish Fork City.	Feb. 3, 1922	Feb. 5, 1925	200	do.	9,651.94	
	Springville City.	July 8, 1920	July 26, 1923	125	1 cent to 2 cents.	1,607.10	Minimum monthly payment \$40.
	Phelps Construction Co.	June 30, 1922	Sept. 30, 1922	50	Strawberry Valley standard.	225.00	Highway construction.

¹ Latest available report states that the total power revenues amounted to \$324,008.18 for the year Oct. 1, 1920, to Sept. 30, 1921.

## PURCHASES.

*Purchases of material and supplies, 1910-1923.*

Fiscal year.	Number of purchases.	Gross amount.	Discount.
1910.....	1,774	\$504,023.80	.....
1911.....	1,607	574,323.74	.....
1912.....	2,206	930,018.53	.....
1913.....	2,735	459,890.17	\$4,286.29
1914.....	3,116	471,466.28	4,604.28
1915.....	2,854	454,661.46	3,842.09
1916.....	5,049	680,601.99	6,747.88
1917.....	4,989	1,095,830.36	12,000.26
1918.....	6,215	1,809,560.84	17,876.29
1919.....	5,038	1,489,583.04	8,727.12
1920.....	3,968	948,270.46	9,522.42
1921.....	6,599	2,314,782.36	18,383.04
1922.....	5,892	1,678,919.00	17,153.70
1923.....	6,423	1,863,802.39	30,448.45
Total.....	58,464	15,275,734.22	134,592.31

## TRANSPORTATION.

*Freight and express data.*

Fiscal year.	Bills settled.	Commercial charges.	Deduct account of contracts, land grant, and other causes.	
			Total.	Per cent.
1907.....	\$278,782.10	\$470,863.26	\$192,081.16	40.8
1908.....	369,583.04	577,803.42	208,247.38	36.0
1909.....	778,047.12	1,403,970.10	625,922.98	44.5
1910.....	437,082.61	758,808.76	321,776.15	42.4
1911.....	405,360.55	666,876.59	261,516.04	39.2
1912.....	610,740.23	1,055,733.27	444,993.04	42.1
1913.....	481,118.91	837,077.59	355,958.68	42.5
1914.....	547,706.99	927,163.49	379,457.50	40.9
1915.....	778,808.33	1,393,347.96	614,454.63	44.1
1916.....	471,606.52	817,481.33	345,874.81	42.3
1917.....	393,477.70	653,013.96	259,536.28	39.7
1918.....	324,562.28	608,479.63	283,917.35	46.6
1919.....	331,056.20	534,580.94	203,524.74	38.1
1920.....	267,303.53	452,101.12	184,797.59	41.9
1921.....	359,499.56	599,730.66	240,231.10	40.0
1922.....	411,817.80	737,481.39	325,662.59	44.2
1923.....	406,766.25	667,138.77	260,729.21	40.4
Total.....	7,653,353.72	13,161,652.26	5,517,681.23	41.9

## FINANCES.

## GENERAL CLASSIFICATION.

For convenience and also because of the distinctive character of the work the finances are grouped under three general headings relating to—

- (a) Reclamation-fund projects.
- (b) Indian projects.
- (c) Other projects and investigations.

Reclamation-fund projects include those constructed primarily from the reclamation fund. Incidentally other funds have been made available for these projects, appropriations being made from the General Treasury under the following headings:

Judgments Court of Claims.

Increase of compensation.

Rio Grande Dam.

Wind River Indian (Riverton).

Indian projects comprise work being done for the Bureau of Indian Affairs, the Bureau of Reclamation acting as a contractor. The appropriations are made for the Bureau of Indian Affairs and the combined financial statements do not include any of these funds except the one named in the foregoing, Wind River Indian (Riverton). This project, now known as Riverton, was initiated by funds appropriated for the Bureau of Indian Affairs, but is now being completed from the reclamation fund; hence it is classed as a reclamation-fund project, necessitating the inclusion of the Indian funds in the financial statements for reclamation-fund projects.

Other projects and investigations include the Yuma auxiliary; general investigations, Reclamation Service, 1923–December 31, 1924; and drainage and cut over. The Yuma auxiliary is a division of the Yuma project being constructed and operated by funds advanced by the purchasers of land and water rights. As no part of the reclamation fund is used it is not considered a reclamation-fund project, but treated as a separate entity.

General investigations, Reclamation Service, 1923–December 31, 1924, is the work being done as the result of an appropriation of \$275,000, March 4, 1923, authorizing the investigation of irrigation possibilities in various places. As this fund is separate and distinct from the reclamation fund it is not included in the combined financial statements.

Drainage and cut over refers to an appropriation of \$100,000 to investigate drainage and timber cut-over lands in all parts of the United States. By the transfer in the Treasury to surplus of \$205.93 this account is closed.

## RECLAMATION FUND.

This fund was created by an act of Congress June 17, 1902, known as the reclamation act. The act set aside certain portions of the receipts from the sale of public lands and town-site lots on reclamation projects. These receipts have been gradually declining, resulting in a corresponding decrease in the accretions to the reclamation fund. Subsequent acts of Congress have provided other sources of increment, notably the oil leasing act of February 25, 1920 (41 Stat. 437), under which a percentage of the royalties are credited to the reclamation fund. Small amounts have also been received from potassium royalties and rentals under the act of October 2,

1917 (40 Stat. 297), and from Federal water-power leases under the act of June 10, 1920 (41 Stat. 1063).

Table 1 is a statement of accretions to date from all sources to the reclamation fund. This statement gives the amounts by States, with the exception of \$1,863.75 from Federal water-power licenses, for which the data by States is not now available.

**BALANCES—RECLAMATION, WIND RIVER INDIAN, YUMA AUXILIARY, GENERAL INVESTIGATIONS, AND DRAINAGE AND CUT-OVER FUNDS.**

Table 2 is a statement of the above funds, showing balances on hand July 1, 1922, receipts or appropriations and expenditures during the fiscal year 1923, and balances on hand July 1, 1923. Briefly these figures are as follows:

<b>Reclamation fund:</b>		
Balance July 1, 1922.....	\$4,302,884.53	
Receipts fiscal year 1923.....	10,929,979.88	
		\$15,232,864.41
Expenditures not including liabilities.....		10,583,506.95
Balance on hand July 1, 1923.....		4,649,267.46
<b>Wind River Indian (Riverton):</b>		
Balance on hand July 1, 1922.....	1,225.87	
Receipts.....	209.13	
		1,435.00
Expenditures and transferred to surplus.....		1,131.39
Balance on hand July 1, 1923.....		303.61
<b>Yuma auxiliary:</b>		
Balance on hand July 1, 1922.....	128,792.40	
Receipts.....	121,760.85	
		250,552.75
Expenditures not including liabilities.....		174,015.97
Balance on hand July 1, 1923.....		76,536.78
<b>General investigations:</b>		
Appropriation Mar. 4, 1923.....		275,000.00
Expenditures not including liabilities.....		16,408.24
Balance on hand July 1, 1923.....		258,591.76
<b>Drainage and cut over:</b>		
Balance on hand July 1, 1922.....		206.93
Transferred to surplus.....		206.98
Balance on hand July 1, 1923.....		0

**FUNDS TO DATE, RECLAMATION-FUND PROJECTS.**

In addition to the reclamation fund proper and the other funds mentioned under "General classification" the general Treasury advanced \$20,000,000 also to be used in connection with the reclamation fund projects. This advance is now being repaid at the rate of \$1,000,000 per year, \$3,000,000 having been refunded to date. Below is a summarization of the funds to date:

Reclamation fund as per statement, Table 1.....		\$118,493,463.22
<b>Other funds:</b>		
Judgments, Court of Claims.....		550,347.58
Rio Grande dam.....		1,000,000.00
Increase of compensation (net).....		2,477,374.49
Wind River Indian (Riverton).....		359,479.65
Total capital funds.....		122,880,664.94
Advance from General Treasury.....	\$20,000,000	
Less amount repaid.....	3,000,000	
		17,000,000.00
Total funds.....		139,880,664.94
<b>Less cash on hand:</b>		
Reclamation fund.....	4,649,267.46	
Wind River Indian (Riverton).....	303.61	
		4,649,571.07
Amount expended.....		135,231,093.87
Plus project collections reexpended.....		46,495,363.35
Grand total expenditures, not including liabilities (see Table 14).....		181,726,457.22

The item of \$46,495,363.35 represents all collections for construction and operation and maintenance repayments, rentals, sales, etc. All of these collections, with the exception of \$985.65 creditable to Wind River (Indian) appropriation, are credited to the reclamation fund and reexpended within congressional limitations. Hence the grand total expenditures or disbursements may exceed the grand total of the reclamation fund.

#### APPROPRIATIONS.

Table 3 is a statement showing the status of the appropriations for reclamation fund and Indian projects, fiscal year 1923. The operations of the Bureau of Reclamation, in connection with the reclamation fund, are limited, first, by the balance in the fund and, second, by congressional appropriations or authorizations. Thus it is essential that approximate data be available as to the accretions to the reclamation fund a considerable period in advance, in order that the work may be economically planned, and that a control on the expenditures be kept by projects to prevent exceeding congressional authorizations. The statement referred to analyzes the 1923 authorizations, gives the actual expenditures, the balances unexpended, the liabilities, and the unincumbered balances which will in due time be closed out. The total authorized, as indicated, is made up of not only the amounts specified in the appropriations act but the authorized 10 per cent transfers between projects, the actual expenditures on account of increase of compensation and the miscellaneous collections which are additions to the project available funds.

#### ASSETS, LIABILITIES, AND CAPITAL.

Table 4 is a consolidated statement of assets, liabilities, and capital as of June 30, 1923, for reclamation fund projects. This statement attempts to set forth as nearly as possible the true status of the funds set aside and invested in reclamation-fund projects. The assets include cash on hand, value of inventories and plant not charged to construction or operation and maintenance cost, accounts receivable, both due and not due, the value of irrigation projects being constructed and not covered by specific repayment contracts, etc. Some projects have been wholly or partly abandoned and in a few cases the water users have been relieved of repayment of certain amounts. These amounts together with the investment in abandoned projects have been treated as amounts which will not be repaid to the reclamation fund and hence offset the capital. Also there has been an investment in what is known as secondary projects. The return of this investment depends of course upon the construction of projects. On account of the uncertainty of the adoption of projects to which the investment can be charged the entire amount is treated as an offset to capital. Another amount which will not be returned is the appropriation of \$1,000,000 for the Rio Grande dam, which appropriation was for the purpose of providing water for lands in Mexico and is not chargeable to the water users on the Rio Grande project. These items which deplete the capital are, however, offset by what for lack of a better term are called "reserves." These are receipts such as rentals of grazing and farming lands, construction penalties, etc., which are not considered creditable to water users and are therefore returns in addition to the

contracts for water rights. It will be noted that the capital, or the funds set aside by the United States for reclamation-fund projects, amounts to date to \$122,880,664.94, which, together with the unpaid advance from the Treasury (\$17,000,000) amounts to \$139,880,664.94. Of this amount only \$3,119,581.12, or 2.2 per cent, is of doubtful returnable value.

The accounts receivable (due) have increased considerably on account of the financial depression and consequent necessity of temporary relief.

The operation and maintenance, unaccrued, totals \$1,748,006.70. This includes the cost for the first half of the calendar year 1923, which will, under public notices already issued, be billed and transferred to charges due during the fiscal year 1924. It also includes some amounts which have, by specified contract, been deferred as to payment to some future date. It also includes the excess of cost over charges or contracts, owing to the fact that it has not always been practicable to assess charges to cover the entire cost.

#### CONSTRUCTION COSTS.

Table 5 is a statement summarizing, by projects, the net construction cost, loss, nonreimbursable, contracted returns, and balances. By net cost is meant the gross, less incidental revenues such as rentals of buildings, etc. These revenues are distinguished from contracted returns in that the latter are in the nature of permanent water rights.

Constructed returns include individual water-right applications, agreements with water users' organizations, etc., and the amounts advanced for construction purposes by beneficiaries prior to execution of the work.

The balance includes the cost which has not been covered by repayment contracts or classed as loss or nonreimbursable. On the statement of assets and liabilities the balance as of June 30, 1923, is listed as an asset because it represents a value that is secured by irrigable land of little value without water, and the security is further enhanced in the case of public land in that entry can only be made, subject to the reclamation law and, in the case of private land much of it is in one form or another obligated to the United States.

#### OPERATION AND MAINTENANCE COSTS.

Tables 6 and 7 are statements showing the status, by projects, of the operation and maintenance, the first indicating the results as of December 31, 1922, and the second as of June 30, 1923.

Similar to the construction statement, the net cost represents the gross, less incidental revenues.

The contracted returns include charges billed and definite contracts to repay the cost at some specified time. The "balance" is the excess of cost over loss and contracted returns. The balance, in the case of the statement as of June 30, 1923, includes the cost for the first half of the calendar year 1923, which amount is already covered by public notices and will be billed at the appropriate time.

The statement as of December 31, 1922, is for the purpose of showing the results at the close of the last operating season. The contra balances in the column "calendar year 1922" indicate an excess for the year of contracted returns over cost. Likewise the



contra balances in the column "to December 31, 1922," indicate an excess to date of contracted returns over cost. Even on projects where there is an excess to date of contracted returns over cost the investment of the United States in operation and maintenance is considerable as it includes outstanding bills and contracted charges unaccrued.

#### REPAYMENTS.

Table 8 is a statement showing the status of the accrued construction charges, or those charges which are intended to return the "net construction cost."

Table 9 is a similar statement for operation and maintenance.

#### MISCELLANEOUS RETURNS.

Tables 10, 11, and 12 are statements showing the status of accrued charges in connection with various classes of revenues—rentals of irrigating water, rentals of power and light, and rentals of grazing and farming lands.

Table 13 is a statement showing the uncollected balances of miscellaneous accounts.

A brief summary of the status of repayments and revenues is as follows:

	Due to June 30, 1923.	Collected to June 30, 1923.	Uncollected June 30, 1923.
Construction charges.....	\$17,765,730.67	\$15,226,608.21	\$2,539,122.46
Operation and maintenance charges.....	13,776,549.47	11,352,900.41	2,423,649.06
Rentals, water.....	7,360,402.27	7,180,355.04	180,047.23
Rentals, power and light.....	2,500,519.47	2,556,978.41	33,541.06
Rentals, grazing, and farming lands.....	759,065.92	739,037.48	20,028.44
Total.....	42,250,357.80	37,055,779.55	5,194,578.25
Miscellaneous uncollected.....			124,431.82
Grand total uncollected.....			5,319,010.17

<sup>1</sup> Includes \$658,741.63 credits other than cash.

The reclamation act provides for the return by the beneficiaries of the expenditures, and these returns or collections go back to the fund. Below is a statement of all cash collections for the year and to date:

	Fiscal year 1923.	To June 30, 1923.
Repayments, construction <sup>1</sup> .....	\$2,334,806.79	\$15,268,240.26
Operation, and maintenance <sup>2</sup> .....	1,803,337.29	11,260,212.72
Revenues:		
Rentals of water.....	257,058.59	7,156,546.01
Rentals of power and light.....	242,954.23	2,493,430.09
Rentals of grazing and farming lands <sup>3</sup> .....	199,279.21	696,513.93
Repaid by Bureau of Indian Affairs.....		2,907,528.24
Miscellaneous.....	806,493.11	6,621,000.45
Total.....	5,143,928.22	46,404,377.79

<sup>1</sup> Includes amounts paid in advance of due dates, \$307,116.07 as of June 30, 1923; \$243,312.31, fiscal year 1923; and \$63,803.73, prior years.

<sup>2</sup> Includes amount paid in advance of due dates, \$19,183.42 for the year and to date; also penalties and interest, \$66,735.45 for the year and \$215,183.90 to date.

<sup>3</sup> See Klamath project statement for adjustment.

The following is a comparison of total collections during the past six fiscal years:

1918	.....	\$3, 459, 446. 00
1919	.....	3, 862, 224. 67
1920	.....	4, 911, 882. 83
1921	.....	4, 191, 884. 13
1922	.....	4, 294, 507. 34
1923	.....	5, 143, 928. 22

For collections by years prior to 1918 see twentieth annual report.

#### NET INVESTMENT, RECLAMATION FUND PROJECTS.

By net investment is meant the actual disbursements less the collections. What is known as transfers between projects affect the net results for a particular project, but for the Service as a whole the net investment is not affected.

Table 14 is a statement showing the net investment by projects. The expenditures in connection with the civil-service retirement fund and the Denver, Washington, and field legal offices may be considered as in transit to project accounts, as ultimately they will be transferred to projects. It may be further stated that the net investment for each project is the amount that would return to the United States its full cash outlay. This, of course, does not take into consideration liabilities.

#### NET INVESTMENT, OTHER THAN RECLAMATION FUND PROJECTS.

As previously stated, in addition to "Reclamation fund projects" the Bureau of Reclamation is interested in funds for the following: Yuma auxiliary; Drainage and cutover; General investigations, Reclamation Service 1923-December 31, 1924; Indian projects (Blackfeet, Flathead, Fort Peck).

Table 15 is a statement showing the net investment as of June 30, 1923.

TABLE 1.—*Accretions to reclamation fund, by States.*

	Sales of public lands.		Sale of reclamation townships.		Proceeds from oil leasing act. <sup>1</sup>		Potassium royalties and rentals. <sup>1</sup>	Totals to June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Past production.	Current production.		
Arizona.....	\$95,424.42	\$2,093,138.64						\$2,093,138.64
California.....	180,308.52	7,293,238.45			\$2,004,025.61	\$1,585,248.90	\$16,178.64	10,978,901.80
Colorado.....	183,683.60	6,614,028.49				13,000.00		6,627,028.49
Idaho.....	80,927.84	6,639,463.76	\$72.38	\$175,889.07		180.11		6,815,468.94
Kansas.....	5.06	1,034,192.31						1,034,192.31
Louisiana <sup>1</sup> .....					494.08	638.79		1,123.78
Montana.....	183,907.02	14,635,020.46	884.31	120,644.34		286,860.18		15,072,814.90
Nebraska.....	4,323.24	2,060,646.99						2,060,646.99
Nevada.....	34,512.14	898,194.15						898,194.15
New Mexico.....	136,842.85	5,667,145.34				1,617.65		5,658,762.99
North Dakota.....	* 4,392.49	12,207,264.03				3,773.86		12,211,027.99
Oklahoma.....	* 12,375.41	5,914,822.72						5,914,822.72
Oregon.....	64,248.23	11,604,931.17						11,604,931.17
South Dakota.....	21,362.59	7,677,910.47	248.70	74,573.99		45.94		7,782,532.33
Utah.....	144,523.30	3,541,440.06				37,060.99		3,578,500.05
Washington.....	31,955.19	7,265,632.79				4,315.15		7,269,947.94
Wyoming.....	255,536.01	7,536,162.14	6,884.65	205,361.45	2,121,620.27	6,098,194.11		15,969,337.97
Total.....	1,382,863.13	106,703,102.09	8,067.04	676,420.68	4,216,265.81	7,979,631.65	16,178.64	118,491,569.47
Proceeds Federal water power licenses <sup>1</sup> .....							1,953.75	1,953.75
Grand total.....								118,493,493.29

<sup>1</sup> Totals to June 30, 1922.

Total proceeds for fiscal year 1923:

Oil leasing act, past production.....

Oil leasing act, current production.....

Potassium royalties and penalties.....

Federal water power licenses.....

Subject to adjustment.....

\* Contra.

\$44,788.63

4,346,633.96

1,953.46

1,767.44

TABLE 2.—Available funds, expenditures and balances, fiscal year 1923 (except for Indian projects).

	Appropriation.	Reclamation fund projects.		Other projects and investigations.			Increase of com- pensation.
		Reclamation fund.	Wind River Indian (Riverton).	Yuma auxiliary.	General investi- gations.	Drainage and cutover.	
Balance on hand July 1, 1922.	\$1,382,853.13	\$4,302,894.53	\$1,225.87	\$128,792.40		\$205.93	
Proceeds from sale public lands.	8,067.04						
Proceeds from sale of town lots.							
Proceeds from oil leasing act:							
Past production.	44,788.63						
Current production.	4,346,688.96						
Proceeds from potassium royalties.	1,988.46						
Proceeds from Federal water-power leases.	1,757.44						
Project collections.	5,143,928.22	10,929,978.88	.19		\$275,000.00		\$270,711.79
From general treasury.			208.94				
From miscellaneous collections.	1,083.93						
From sale of lands.	11,047.19						
From sale of water rights.	109,649.23			121,760.35			
		15,232,864.41	1,435.00	250,552.75	275,000.00	205.93	270,711.79
Expenditures:							
Repayment bond loan.	1,000,000.00						
Disbursements.	9,583,894.96						
Reclamation fund projects.		10,583,595.95	999.00	174,015.97	16,408.24		
Yuma auxiliary project.	288,827.81						
Reclamation Service 1922-Dec. 31, 1924.	1,874.17						
To surplus.	304.81		161.70			205.93	270,711.79
Balance on hand July, 1923.		4,649,267.46	303.61	76,536.78	258,591.76		

TABLE 3.—Appropriations by projects for the fiscal year 1923, showing increases and decreases authorized, liabilities and expenditures, and balances (to lapse) unencumbered.

State.	Project.	Appropriation act	10 per cent increases and decreases.	Contributed funds not spent previous years.	Increase of compensation (net).	Miscellaneous collections and transfers.	Total authorized.	Expenditures.	Balance unexpended.	Liabilities.	Balance unencumbered (to lapse).
Arizona.....	Salt River.....	\$5,000.00			\$14,452.96	\$76,080.23	\$5,000.00	\$73,259.78	\$5,000.00	\$81,784.24	\$5,000.00
Arizona-California.....	Yuma.....	550,000.00	\$39,600.00		3,559.48	4,108.57	600,913.19	573,360.82	227,653.41	3,854.30	165,899.17
California.....	Grand Valley.....	125,000.00			4,994.61	62,083.07	132,077.68	324,120.97	55,840.33	3,854.30	51,988.03
Colorado.....	Uncompahgre.....	440,000.00			10,324.56	62,564.42	497,082.08	394,120.97	172,961.71	80,267.67	92,694.04
Do.....	Roanoke.....	215,000.00			14,607.71	51,555.34	287,838.98	131,261.41	156,627.57	35,571.71	121,055.86
Idaho.....	Blaine.....	1,200,000.00	122,000.00		24,607.71	43,376.84	1,418,163.05	898,747.05	682,855.00	420,146.66	262,709.24
Do.....	Minidoka.....	1,200,000.00	120,000.00		13,415.92	58,216.70	1,397,092.78	898,747.05	978,345.72	569,267.30	270,048.42
Do.....	King Hill.....	150,000.00			8,522.74	8,916.58	158,904.41	77,077.07	142,512.62	17,153.92	125,358.11
Montana.....	Blaine.....	170,000.00			1,687.85	8,916.58	180,904.41	77,077.07	142,512.62	17,153.92	125,358.11
Do.....	Milk River.....	640,000.00	69,000.00		5,504.69	17,083.08	671,588.61	189,401.52	512,256.02	32,109.49	490,145.53
Do.....	Sun River.....	345,000.00			5,767.73	17,083.08	368,740.81	238,538.33	130,182.48	104,233.49	27,948.89
Montana-North Dakota.....	Lower Yellowstone.....	180,000.00			2,666.60	5,358.17	187,997.77	61,997.93	126,999.84	21,153.33	105,244.51
Nebraska.....	North Platte.....	1,440,000.00	144,000.00		26,068.58	116,083.73	1,726,162.31	1,122,194.93	603,967.38	581,559.64	20,407.74
Nebraska-Wyoming.....	Newlands.....	915,000.00	191,500.00		10,582.57	33,286.25	867,369.82	393,451.07	473,917.75	171,999.49	301,918.26
Nevada.....	Carlsbad.....	66,000.00			2,924.77	20,751.19	88,676.96	41,959.62	46,716.34	177,330.92	46,325.50
New Mexico.....	Rio Grande.....	1,000,000.00			33,948.71	66,122.57	1,100,071.28	828,910.62	271,160.66	177,330.92	93,621.74
North Dakota.....	Williston.....	115,000.00			2,539.55	50,143.93	167,683.48	70,517.44	97,166.04	4,394.64	92,771.40
Oregon.....	Umatilla.....	500,000.00	50,000.00		4,786.83	10,286.34	465,023.17	111,210.01	353,813.16	199,186.06	154,627.11
Oregon-California.....	Klamath.....	700,000.00	70,000.00		8,942.77	26,085.40	665,023.17	468,194.02	196,834.15	77,410.49	119,423.66
South Dakota.....	Belle Fourche.....	350,000.00	35,000.00		3,913.23	17,045.56	335,958.79	50,541.74	285,417.05	8,082.32	277,334.73
Utah.....	Strawberry Valley.....	85,000.00			3,432.57	47,081.95	135,464.52	40,943.54	94,520.98	1,931.21	92,689.77
Washington.....	Okanogan.....	400,000.00	4,000.00		2,890.97	20,224.18	67,085.15	53,200.83	13,884.33	3,988.91	9,895.42
Do.....	Yakima.....	1,500,000.00	170,000.00		31,830.94	57,407.08	1,589,238.02	1,142,784.37	446,513.65	242,481.50	204,032.15
Wyoming.....	Riverston.....	925,000.00			5,065.71	18,098.84	948,194.55	457,285.88	490,908.67	206,632.34	282,256.33
Do.....	Shoshone.....	975,000.00	5,100.00		16,255.13	27,412.50	1,023,767.63	775,969.73	247,797.90	147,036.06	100,761.84
Secondary.....	Baker.....	400,000.00	40,000.00		1,346.95	2,184.42	363,541.37	49,180.83	314,360.51	72.89	314,287.65
Do.....	Others.....	200,000.00			5,972.19	91,576.23	379,010.48	217,863.55	111,141.83	5,765.54	105,376.39
Total reclamation fund projects.....		14,800,000.00			280,250.32	1,415,410.89	16,507,123.27	9,224,482.02	7,282,641.25	3,210,070.75	4,071,970.50
INDIAN PROJECTS.....											
Montana.....	Blackfoot.....	30,000.00			2,389.94	12,239.58	44,629.52	42,270.23	2,359.29	2,359.29	2,546.48
Do.....	Flathead.....	200,000.00			7,948.22	25,660.95	233,609.17	230,654.21	2,954.96	408.48	4,179.47
Do.....	Fort Peck.....	19,000.00			1,089.97	626.95	20,696.92	14,814.79	5,882.13	1,672.66	6,728.96
Do.....	Fort Peck.....	249,000.00			11,378.13	38,527.48	298,906.61	287,739.23	11,166.38	4,440.43	6,728.96

i Contra. Transfers between projects in accordance with the appropriation act. Cash on hand with United States Treasurer and special fiscal agents on projects, \$4,649,267.46.

TABLE 4.—*Assets, liabilities, and capital, reclamation fund projects, June 30, 1925.*

	Balances.	Subtotals.	Total.
<b>Assets:</b>			
Cash—			
Reclamation fund—			
With Treasurer United States	\$3,696,162.42		
With Treasurer United States, unadjusted	.56		
With special fiscal agents	756,114.48	\$4,452,267.46	
Wind River Indian (Riverton)—			
With Treasurer United States		303.61	
With employees, including special deposits		60,004.72	\$4,709,575.79
Inventories—			
Lumber, steel, cement, forage, fuel, etc.			1,091,551.17
Plant and equipment, original value less depreciation			2,496,806.58
Prepaid civil-service retirement fund			6,001.72
Accounts receivable (due)—			
Uncollected construction water-right charges		2,537,222.46	
Uncollected operation and maintenance charges		2,433,649.06	
Uncollected rentals of grazing and farming lands		20,028.44	
Uncollected rentals of power and light		33,541.06	
Uncollected rentals of irrigating water		180,137.23	
Uncollected miscellaneous		124,431.92	5,319,010.17
Accounts receivable (not due)—			
Construction charges unaccrued		83,488,071.33	
Construction charges paid in advance		364,324.27	86,121,737.06
Operation and maintenance charges unaccrued—			
Contracted <sup>1</sup>	518,153.55		
Less charges paid in advance	19,261.60	496,901.66	
Not contracted <sup>2</sup>	1,498,921.34		
Less loss	249,816.59	1,249,104.75	1,748,006.70
Miscellaneous charges unaccrued			276,768.10
Irrigation works—			
Gross construction cost	147,186,969.06		
Less miscellaneous revenues	4,132,967.91	143,054,021.15	
Less—			
Nonreimbursable	1,000,000.00		
Contracted returns	101,253,015.85		
Loss	1,358,979.21	103,611,995.06	39,442,026.09
Undistributed cost of general offices			18,315.38
Investment items in transit			34,769.07
<b>Total assets</b>			<b>138,266,566.84</b>
<b>Liabilities:</b>			
Accounts payable (due)—			
Services, purchases, transportation, etc.	1,446,178.60		
Accounts payable (not due)—			
Uncompleted construction contracts, undelivered purchase orders, special cash deposits, etc.	1,917,563.70	3,363,742.30	
Less contingent asset value of uncompleted contracts, undelivered purchases, etc.		1,858,025.57	1,505,716.78
Treasury loan to reclamation fund—			
Amount loaned		20,000,000.00	
Less amount repaid		3,000,000.00	17,000,000.00
<b>Capital:</b>			
Reclamation fund—			
Proceeds public land sales	105,703,102.69		
Proceeds townsite sales	576,420.68		
Proceeds potassium royalties and rentals	16,178.64		
Proceeds, oil-leasing act—			
Past production	4,216,265.81		
Current production	7,979,631.65		
Proceeds Federal water-power licenses	1,863.75	118,493,463.22	
Special funds—			
Judgments Court of Claims	550,347.58		
Rio Grande Dam	1,000,000.00		
Increase of compensation (net)	2,477,374.49		
Wind River Indian (Riverton)	350,479.65	4,387,201.72	
<b>Total capital</b>		<b>122,880,664.94</b>	
Less—			
Secondary project investigations—			
Net cost	1,996,753.13		
Less funds advanced	463,491.99		
	1,533,261.14		
Construction and operation and maintenance loss	1,608,796.80		
Rio Grande Dam, nonreimbursable	1,000,000.00		
	4,142,056.94		
Less reserves	1,022,242.11	3,119,814.83	119,760,850.11
<b>Total liabilities and unimpaired capital</b>			<b>138,266,566.84</b>

<sup>1</sup> Covered by specific agreements.<sup>2</sup> Includes cost first half of calendar year 1922, to be covered by accruals for the year. Remainder to be covered by future public notices or other agreements.<sup>3</sup> Contra.

TABLE 5.—Consolidated statement, by projects, of net construction cost and contracted repayments.

State and project.	Net cost.		Loss.	Nonreim- bursable.	Contracted repayments.		Balance.	
	Fiscal year, 1923.	To June 30, 1923.			Fiscal year, 1923.	To June 30, 1923.	Fiscal year, 1923.	To June 30, 1923.
Arizona: Salt River.....		\$10,548,119.28	\$382,097.31					
Arizona-California: Yuma.....	\$84,399.70	9,028,572.84			183.14	\$10,166,021.97	183.14	\$3,282,989.67
California: Orland.....	33,838.74	1,061,765.87			31,113.75	5,743,583.17	53,275.96	1,277,776.88
Colorado: Grand Valley.....	252,723.37	4,017,921.98			55,419.27	1,119,572.75	1,21,582.53	
Idaho: Uncompahgre.....	47,880.96	6,715,074.41	47,370.81		999,843.37	1,000,000.00	1,747,120.00	3,017,921.98
Boise.....	305,628.76	12,731,409.73			6,713,584.50	6,713,584.50	47,880.96	1,45,880.90
King Hill.....	409,746.99	1,881,391.45			321,846.06	12,648,436.56	1,16,217.30	82,973.17
Minidoka.....	1,220,737.25	8,086,977.12			2,000,000.00	2,000,000.00	409,746.99	1,118,608.55
Kansas: Garden City.....		886,651.07	334,474.96		196,064.13	7,111,081.99	1,025,073.12	985,865.13
Montana: Huntley.....	7,938.32	1,475,623.45			1,953.19	51,176.11	1,953.19	
Lower Yellowstone.....	66,543.62	3,632,949.27			13,664.19	1,321,333.89	11,602.51	154,289.56
Milk River.....	202,186.94	6,762,063.26			3,614,104.21	3,614,104.21	66,543.62	18,846.06
Sun River.....	210,522.06	4,246,361.84					202,186.94	6,762,063.26
Nebraska-Wyoming: North Platte.....	1,049,244.33	14,011,574.27			1,4,570.80	428,127.04	215,092.86	3,825,224.80
Nevada: Newlands.....	299,084.33	6,990,498.85			124,492.87	8,974,299.52	924,751.46	5,037,274.75
New Mexico: Carlisbad.....	1,374.86	1,895,928.79			154,335.00	2,638,279.01	363,419.33	4,352,219.84
Hondo.....		371,867.17	371,867.17		14,391.75	1,431,872.81	1,15,766.61	135,944.02
New Mexico-Texas: Rio Grande.....	880,765.45	12,146,114.43		\$1,000,000.00	15,000.00	7,650,000.00	885,765.45	3,496,114.43
North Dakota: Buford-Trenton.....	1,099.26	223,168.96	223,168.96				1,099.26	169,303.44
Williston.....	421.43	460,107.18				290,803.74	421.43	168,963.87
Oregon: Umatilla.....	75,142.70	2,874,027.84			17,969.45	2,706,073.97	57,173.22	811,916.34
Oregon-California: Klamath.....	437,841.89	3,978,175.73			1,069,022.45	3,166,259.39	1,631,180.56	970,158.74
South Dakota: Belle Fourche.....	1,252.56	8,567,437.13			120,588.70	2,567,278.39	19,316.14	382,868.63
Utah: Strawberry Valley.....	1,5,493.80	3,466,968.00			1,100.00	3,084,090.37	1,6,593.80	
Washington: Okanogan.....	1,4,317.26	1,393,740.41			1,4,424.00	1,498,579.29	106.74	1,104,838.88
Yakima.....	1,233,778.73	12,239,239.57			115,942.05	9,712,908.74	1,117,836.68	2,526,330.83
Wyoming: Riverton.....	425,820.45	1,060,228.09					425,820.45	1,060,228.09
Shoshone.....	811,155.85	8,291,013.17			691,335.37	5,591,539.43	119,820.48	2,699,473.74
Total.....	7,991,079.27	143,064,021.15	1,388,979.21	1,000,000.00	3,542,941.53	101,253,015.85	4,444,025.06	39,442,026.09

1 Contin.

) Contra

TABLE 6.—Consolidated statement, by projects, of net operation and maintenance cost and contracted repayments, by calendar years.

State and project.	Net cost.		Loss.	Contracted repayments.		Balance.	
	Calendar year 1922.	To Dec. 31, 1922.		Calendar year 1922.	To Dec. 31, 1922.	Calendar year 1922.	To Dec. 31, 1922.
Arizona-California:							
Yuma.....	\$238,813.90	\$1,515,443.58		\$238,178.19	\$1,120,341.49	\$635.71	\$395,102.09
California: Orland.....	35,319.01	200,510.23		35,898.77	200,586.94	1,574.76	1,56.71
Idaho:							
Boise.....	227,468.45	1,407,933.13		283,967.12	1,474,415.41	1,66,518.67	1,66,482.28
Minidoka.....	112,132.99	1,318,703.33		133,904.02	1,366,764.33	1,21,771.03	1,48,061.00
Montana:							
Huntley.....	39,730.89	829,707.53		45,671.79	422,824.78	1,5,940.90	406,862.75
Sun River.....	14,569.42	192,237.02		13,991.43	162,318.28	577.99	29,918.74
Montana-North Dakota: Lower Yellowstone.....	1,87,782.78	204,172.49		1,89,348.60	204,172.49	1,565.82	
Nebraska - Wyoming North Platte.....	178,791.58	1,609,453.54		199,388.74	1,759,286.94	1,20,567.16	1,149,833.40
Nevada: Newlands.....	111,847.35	968,472.89		216,292.87	899,001.87	1,104,445.52	69,471.02
New Mexico: Carlisle.....	55,587.90	460,691.29		54,961.39	451,730.82	626.51	8,900.38
New Mexico-Texas: Rio Grande.....	213,545.62	447,308.04		215,623.09	445,643.07	1,2,077.47	1,656.97
North Dakota:							
Buford-Trenton.....		78,466.80	\$71,149.39		2,317.41		
Williston.....	20,729.65	342,835.87	178,667.20	20,729.65	164,168.67		
Oregon: Umatilla.....	34,193.79	324,976.70		37,431.42	335,750.19	1,3,287.63	1,10,773.49
Oregon - California: Klamath.....	42,186.04	544,908.95		44,650.84	557,394.35	1,2,464.80	1,12,485.40
South Dakota: Belle Fourche.....	55,685.88	922,477.91		100,108.30	874,542.19	1,44,422.42	47,985.72
Utah: Strawberry Valley.....	39,926.90	341,502.04		61,190.29	271,384.31	1,21,263.39	70,117.73
Washington:							
Okanogan.....	1,39,911.49	265,594.79		56,741.07	263,696.06	1,96,632.56	1,896.73
Yakima.....	280,173.02	2,108,493.42		253,611.40	2,136,749.87	1,23,438.38	1,33,256.45
Wyoming: Shoshone.....	58,431.13	566,357.43		74,187.68	607,162.49	1,15,756.55	1,20,805.06
Total.....	1,581,430.25	14,609,288.89	249,816.59	2,007,194.46	13,720,231.96	1,425,755.21	690,190.34

1 Contra.

NOTE.—Contras in balance columns indicate excess of contracted returns over net costs.



TABLE 7.—*Consolidated statement, by projects, of net operation and maintenance cost and contracted repayments, by fiscal years.*

State and project.	Net cost.		Loss.	Contracted repayments.		Balance.	
	Fiscal year 1923.	To June 30, 1923.		Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
Arizona-California:							
Yuma.....	\$263,211.20	\$1,667,934.67	.....	\$244,747.40	\$1,133,166.79	\$18,463.80	\$535,764.88
California: Orland.....	38,575.24	213,510.67	.....	38,597.00	200,570.17	2,678.24	18,040.50
Colorado: Uncom- pahgre.....	81,724.16	81,724.16	.....			81,724.16	81,724.16
Idaho:							
Boise.....	223,548.24	1,530,627.13	.....	284,457.28	1,478,991.48	160,909.04	51,635.65
Minidoka.....	118,991.91	1,369,602.32	.....	139,029.20	1,408,898.11	120,037.29	124,293.79
Montana:							
Huntley.....	39,003.14	849,287.82	.....	47,975.18	424,074.36	18,972.04	425,313.46
Sun River.....	13,404.24	199,251.24	.....	13,841.50	162,102.10	1437.26	37,149.14
Montana - North Dakota: Lower Yellowstone.....	44,115.78	221,920.66	.....	37,153.52	199,415.17	3,962.26	22,505.39
Nebraska - Wyo- ning: North Platte	167,587.99	1,693,539.13	.....	207,788.12	1,786,213.46	140,200.13	192,674.32
Nevada: Newlands	118,496.21	1,044,218.12	.....	119,180.30	896,001.46	1634.09	148,211.66
New Mexico: Carls- bad.....	43,386.26	481,790.66	.....	58,702.87	455,830.91	15,316.61	25,989.65
New Mexico-Texas: Rio Grande.....	181,557.60	548,366.12	.....	217,989.35	447,604.14	136,431.75	100,761.98
North Dakota:							
Buford - Tren- ton.....		73,466.80	\$71,149.39		2,317.41		
Whiston.....	28,796.05	357,244.00	178,667.20	10,487.83	180,268.88	18,308.22	18,308.22
Oregon: Umatilla..	34,732.77	343,488.77	.....	35,485.47	334,579.09	1753.70	8,909.08
Oregon-California: Klamath.....	53,028.23	578,566.15	.....	54,894.63	557,383.17	1886.40	21,172.96
South Dakota:							
Belle Fourche...	56,378.71	951,665.57	.....	99,697.07	874,196.81	143,318.36	77,466.76
Utah: Strawberry Valley.....	24,415.90	352,254.65	.....	128,260.13	346,183.18	103,834.23	6,071.47
Washington:							
Okanogan.....	43,535.09	287,633.34	.....	55,952.47	264,174.81	12,417.38	23,458.53
Yakima.....	234,364.05	2,228,579.28	.....	268,086.73	2,211,433.54	133,724.68	12,145.74
Wyoming: Sho- shone.....	58,835.72	616,200.16	.....	74,799.54	607,109.91	15,963.82	9,096.26
Total.....	1,864,688.58	15,690,956.22	249,816.50	2,134,367.68	13,944,509.65	269,679.10	1,496,629.90
Idaho: Boise (drainage).....	36,913.77	101,260.22	.....	149,822.29	348,785.45	112,906.52	1247,535.20
Total.....	1,901,602.35	15,792,216.44	249,816.50	2,284,189.97	14,293,295.10	382,587.62	1,249,104.70

<sup>1</sup> Contra.

TABLE 8.—Construction repayments (including funds advanced for construction).

State and project.	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
Arizona: Salt River.....	\$333,044.46	\$886,961.32	\$276,161.05	\$886,961.32		
Arizona-California: Yuma.....	168,372.26	1,155,139.22	153,666.89	1,080,550.41	1,152.57	\$73,436.24
California: Orland.....	65,944.77	235,229.42	65,944.77	235,229.42		
Colorado:						
Grand Valley.....	156.63		156.63			
Uncompahgre.....	145,327.50	146,261.30	28,165.08	29,098.88	14,497.08	102,665.34
Idaho:						
Boise.....	480,244.95	1,737,824.13	287,431.46	1,374,177.52	25,092.00	338,554.61
King Hill.....	50,664.77	127,416.97				127,416.97
Minidoka.....	391,880.67	2,961,962.58	268,757.73	2,499,876.11	154,289.87	307,796.60
Kansas: Garden City <sup>1</sup> .....	1,953.19	51,176.11	1,618.19	51,176.11		
Montana:						
Huntley.....	25,526.60	392,645.03	14,537.91	359,845.36	502.21	32,297.46
Sun River.....	11,563.88	180,357.20	5,036.87	140,900.36	96.67	19,360.17
Montana-North Dakota:						
Lower Yellowstone.....		41,135.10		41,135.10		
Nebraska-Wyoming: North Platte.....	430,764.49	2,412,447.91	173,632.87	1,707,873.53	34,294.92	670,279.46
Nevada: Newlands.....	38,799.68	545,370.05	32,121.25	514,775.66	6,004.95	24,589.44
New Mexico: Carlsbad.....	53,507.46	425,876.33	59,957.65	390,447.79		35,428.54
New Mexico-Texas: Rio Grande.....	71,500.00	76,580.00	76,491.00	76,491.00		9.00
Oregon: Umatilla.....	65,142.17	406,632.51	51,583.91	356,599.38		50,033.13
Oregon-California: Klamath.....	65,525.88	567,811.58	61,373.28	537,270.01		30,541.57
South Dakota: Belle Fourche.....	117,996.04	749,203.60	14,747.62	477,672.39	219.16	271,312.06
Utah: Strawberry Valley.....	120,520.50	476,345.47	82,707.41	396,396.76		79,948.71
Washington:						
Okanogan.....	5,463.55	56,194.73	13,154.51	54,281.38		1,913.35
Yakima.....	383,496.40	3,349,086.75	236,419.84	3,139,467.63	28,715.95	180,553.17
Wyoming: Shoshone.....	116,358.22	802,203.36	27,573.40	610,898.05	518.67	190,786.64
	2,422,967.49	17,763,730.67	2,027,689.70	14,961,124.17	265,384.04	2,537,222.46
Paid in advance of due dates.....			307,116.09	307,116.09		
Totals.....			2,334,805.79	15,268,240.26		

<sup>1</sup> Contra.<sup>2</sup> From sale of land and plant.<sup>3</sup> Includes \$63,803.78 prior years.

NOTE.—Uncollected balance June 30, 1923, 14.2 per cent of total accruals to date.

TABLE 9.—Operation and maintenance repayments.<sup>1</sup>

(Public notice.)

State and project.	Due.		Collected.				Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.		
			Fiscal year 1923.	To June 30, 1923.			
Arizona-California: Yuma.....	\$235,559.45	\$1,120,280.38	\$249,381.48	\$923,705.72	\$17,315.37	\$179,259.29	
California: Orland.....	37,725.63	210,932.07	35,781.89	200,313.78	10,399.67	218.62	
Idaho:							
Boise.....	279,583.71	1,499,239.50	222,170.41	1,206,761.29	41,525.01	250,953.20	
Boise (drainage).....	141,873.29	342,078.62	119,334.36	186,336.87	3,169.14	152,572.61	
Minidoka.....	144,588.53	1,359,542.28	115,024.07	1,114,591.30	67,958.01	176,092.97	
Montana:							
Huntley.....	45,902.54	424,162.62	31,960.04	313,915.45	7,517.39	102,729.78	
Sun River.....	13,432.44	162,915.30	7,935.10	122,618.61	2,870.50	37,426.19	
Montana-North Dakota:							
Lower Yellowstone.....	49,932.24	194,102.80	17,024.45	62,359.28	4.63	131,738.89	
Nebraska-Wyoming: North							
Platte.....	203,423.00	1,792,629.38	99,284.45	1,313,022.67	41,288.98	438,317.73	
Nevada: Newlands.....	117,626.63	804,999.26	97,741.12	688,981.95	23,878.12	92,139.19	
New Mexico: Carlsbad.....	53,847.83	447,736.24	68,098.91	391,380.60	6,129.90	50,225.74	
New Mexico-Texas: Rio							
Grande.....	172,472.90	389,078.40	172,472.90	384,591.96	4,486.44	.....	
North Dakota:							
Buford-Trenton.....		2,317.41		2,317.41	.....	.....	
Williston.....	25,899.10	71,920.30	1,370.00	26,677.75	.....	45,242.55	
Oregon: Umatilla.....	28,927.06	279,861.19	30,736.24	244,913.98	3,286.43	31,660.78	
Oregon-California: Klamath.....	63,819.61	492,906.92	50,433.74	411,431.46	30,059.60	51,415.86	
South Dakota: Belle Fourche.....	98,745.18	870,863.27	17,435.61	513,490.05	12,452.64	344,920.58	
Utah: Strawberry Valley.....	53,773.88	277,137.19	49,445.02	240,986.27	8,354.09	27,796.83	
Washington:							
Okanogan.....	35,991.50	220,967.53	48,844.75	214,634.33	2,614.61	3,718.59	
Yakima.....	265,917.99	2,204,765.88	259,025.22	2,057,779.02	29,070.62	117,916.24	
Wyoming: Shoshone.....	72,290.93	618,112.93	23,913.68	405,060.65	14,648.86	188,408.42	
	2,141,333.44	13,776,549.47	1,717,413.44	11,025,870.40	327,030.01	2,423,649.06	
Paid in advance of due dates.....			19,188.42	19,188.42	.....	.....	
Penalty and interest.....			66,735.43	215,153.90	3,735.55	.....	
Totals.....			1,803,337.29	11,260,212.72	.....	.....	

## SUMMARY OF PENALTIES AND DISCOUNTS.

Item.	Fiscal year 1923.			To June 30, 1923.		
	Cash.	Other.	Total.	Cash.	Other.	Total.
Penalties.....	\$66,735.43	\$2,635.87	\$67,371.30	\$215,153.90	\$3,735.55	\$218,889.45
Discounts.....			24,933.20			220,297.37
Net.....			42,438.10			1,407.92

<sup>1</sup> Contra.

NOTE.—Uncollected balance June 30, 1923, 17.5 per cent of total accruals to date.

TABLE 10.—*Operation and maintenance repayments.*

[Water rentals prior to public notice.]

State and project.	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June, 1923.		
Arizona: Salt River.....		\$2,246,726.01		\$2,246,726.01		
Arizona-California: Yuma.....	\$33,231.33	495,992.84	\$30,429.09	490,848.77	\$292.01	\$4,862.06
California: Orland.....	229.50	120,384.00	229.50	120,384.00		
Colorado:						
Grand Valley.....	51,000.98	219,829.34	44,727.64	184,502.13	2,422.58	32,904.63
Uncompahgre.....	10,531.97	1,182,776.10	53,366.30	1,136,588.52	9,835.62	36,351.96
Idaho:						
Boise.....	18,767.97	740,015.18	16,756.50	722,167.21	4,720.50	13,127.47
King Hill.....	28,726.24	52,230.73	25,978.80	49,369.37		2,861.36
Minidoka.....	2,916.32	270,803.36	2,648.72	267,301.53	3,224.23	267.60
Montana:						
Huntley.....	1,181.09	6,340.36	1,061.35	6,132.44		207.92
Milk River.....	19,637.09	176,106.28	18,608.63	152,148.26	487.21	23,470.81
Sun River.....	13,357.02	48,244.88	8,456.00	21,121.30	230.69	26,862.89
Montana-North Dakota: Lower Yellowstone.....	1,242.60	123,265.68	2,400.93	121,869.18		1,396.50
Nebraska-Wyoming: North Platte.....	8,883.99	168,841.72	9,791.12	168,255.61	2.00	584.11
Nevada: Newlands.....	1,282.95	16,936.22	1,348.20	16,916.72		19.60
New Mexico:						
Carlsbad.....	383.25	19,241.69	383.25	19,241.69		
Hondo.....		9,165.19		9,129.70		35.49
New Mexico-Texas: Rio Grande.....	19,374.19	1,106,475.44	31,566.69	1,075,447.26		34,028.18
North Dakota:						
Burdett-Trenton.....		31.75		31.75		
Williston.....		2,117.28		2,117.28		
Oregon: Umatilla.....	1,314.16	32,100.24	2,280.19	32,100.24		
Oregon-California: Klamath.....	824.01	43,013.63	871.87	42,537.83		475.80
South Dakota: Belle Fourche.....	408.72	5,060.10	408.72	4,910.10		150.00
Utah: Strawberry Valley.....		8,388.39		8,388.39		
Washington:						
Okanogan.....	474.58	110,450.85	362.40	106,222.69	2,584.19	1,643.97
Yakima.....	4,151.29	140,588.96	4,277.38	139,974.13		614.83
Wyoming: Shoshone.....	847.28	12,366.06	1,063.31	12,113.90		252.15
	218,766.52	7,360,492.27	257,058.56	7,156,546.01	23,809.03	180,137.23

TABLE 11.—*Rentals of power and light.*

State and project.	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
Arizona: Salt River.....		\$208,411.03		\$208,411.03		
Idaho:						
Boise.....	\$10,982.20	117,279.80		96,424.61	\$20,855.19	
Minidoka.....	111,246.46	691,771.30	\$111,806.70	663,772.58	4,812.08	\$23,186.64
Nebraska-Wyoming: North Platte.....	28,936.02	83,608.48	26,517.79	68,072.64	12,393.30	3,143.54
Nevada: Newlands.....	23,226.19	184,360.56	23,328.63	157,512.41	25,487.75	1,360.40
New Mexico-Texas: Rio Grande.....		2,243.33		2,243.33		
North Dakota: Williston.....	49,570.46	365,647.50	49,814.46	362,133.00		3,514.50
Oregon-California: Klamath.....	2,214.83	8,234.83	2,214.83	8,234.83		
Utah: Strawberry Valley.....	23,961.48	127,048.89	23,741.72	125,210.42		1,838.47
Washington:						
Okanogan.....		1,754.71		1,754.71		
Yakima.....		3,635.33		3,635.33		
Wyoming: Shoshone.....	5,710.01	6,522.71	5,531.10	6,025.20		497.51
	255,817.65	2,590,519.47	242,954.23	2,493,430.09	63,548.32	33,541.06

TABLE 12.—*Rentals of grazing and farming lands.*

State and project.	Due.		Collected.		Uncollected June 30, 1923.	
	Fiscal year 1923.	To June 30, 1923.	Cash.			Other credits to June 30, 1923.
			Fiscal year 1923.	To June 30, 1923.		
Arizona: Salt River.....		\$19,373.14		\$19,373.14		
Arizona-California: Yuma.....	\$2,531.99	11,856.10	\$3,010.54	11,670.93	\$185.17	
California: Orland.....		32.00		32.00		
Colorado:						
Grand Valley.....	20.00	229.00	20.00	167.00	62.00	
Uncompahgre.....	45.00	152.00	45.00	152.00		
Idaho:						
Boise.....	1 255.55	20,147.79	1 233.62	20,059.09	88.70	
Minidoka.....	1 322.82	33,622.87	662.24	29,367.51	4,255.36	
Montana:						
Huntley.....	832.78	12,195.66	1,261.53	11,659.99	535.67	
Milk River.....	3,956.56	27,139.71	4,249.16	26,732.49	\$20.88 386.34	
Sun River.....	3,216.26	31,332.81	3,370.14	26,725.14	4,607.67	
Montana-North Dakota: Lower Yellowstone.....	273.25	2,974.62	195.25	2,863.62	111.00	
Nebraska-Wyoming: North Platte.....	9,914.39	80,676.92	8,637.46	74,434.86	6,242.06	
Nevada: Newlands.....	532.33	24,584.62	124.73	24,138.62	446.00	
New Mexico: Carlsbad.....	1,653.89	11,695.93	1,413.79	11,161.49	534.44	
New Mexico-Texas: Rio Grande.....	288.20	1,900.20	281.20	1,785.20	15.00	
North Dakota:						
Buford-Trenton.....		423.93		423.93		
Williston.....		249.98		249.98		
Oregon: Umatilla.....	570.90	1,579.50	520.90	1,529.50	50.00	
Oregon-California: Klamath <sup>1</sup> .....	143,053.67	159,406.16	145,306.39	157,962.16	444.00	
South Dakota: Belle Fourche.....	318.77	318.77	318.77	318.77		
Utah: Strawberry Valley.....	15,250.50	135,781.16	15,250.50	135,781.16		
Washington:						
Okanogan.....	50.00	722.50	50.00	722.50		
Yakima.....	1,741.73	21,280.04	1,729.73	21,034.74	245.30	
Wyoming: Shoshone.....	1,198.02	8,468.34	1,142.27	8,107.34	361.00	
Secondary projects.....	12,728.06	164,022.17	11,923.23	110,065.77	42,497.67 1,458.73	
Total.....	197,696.92	759,065.92	199,279.21	696,518.93	42,518.55 20,028.44	

<sup>1</sup> Contra.<sup>2</sup> See project statement for adjustment.TABLE 13.—*Statement of miscellaneous balances due and unpaid (not including construction and operation and maintenance repayments, water rentals, power and light, and grazing and farm land rentals).*

State and project.	Amount	State and project.	Amount.
Arizona-California: Yuma.....	\$11,924.65	Oregon:	
Colorado:		Baker.....	
Grand Valley.....	165.00	Umatilla.....	\$332.98
Uncompahgre.....	186.18	Oregon-California: Klamath.....	2,602.89
Idaho:		South Dakota: Belle Fourche.....	366.26
Boise.....	3,182.92	Utah: Strawberry Valley.....	76.34
King Hill.....	1,999.40	Washington:	
Minidoka.....	402.96	Okanogan.....	1,136.14
Montana:		Yakima.....	1,194.72
Huntley.....	212.32	Wyoming:	
Milk River.....	1,169.14	Riverton.....	16,153.35
Sun River.....	1,606.81	Shoshone.....	10,066.24
Montana-North Dakota: Lower Yellowstone.....	70.80	Secondary projects.....	33,643.54
Nebraska-Wyoming: North Platte.....	4,561.18	Washington office.....	7,722.43
Nevada: Newlands.....	1,435.81	Denver office.....	18,355.10
New Mexico: Carlsbad.....	87.51	Field legal.....	5,584.00
New Mexico-Texas: Rio Grande.....	63.76	<b>Total.....</b>	<b>124,431.92</b>
North Dakota: Williston.....	139.39		

TABLE 14.—Voucher transactions, all funds, and net investment, as of June 30, 1923, reclamation fund projects, including Wind River Indian (Riverton).

State and project.	Expenditures. <sup>1</sup>		Collections. <sup>2</sup>		Net investment.	
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
Arizona: Salt River.....		\$14,671,484.24	\$307,327.63	\$5,041,492.86	\$307,327.63	\$9,629,991.38
Arizona-California:						
Yuma.....	\$429,316.86	12,072,082.49	501,442.47	3,029,643.57	\$ 72,125.61	9,042,438.92
California: Orland.....	80,641.28	1,478,492.80	105,974.83	599,502.60	\$ 25,333.55	878,990.20
Colorado:						
Grand Valley.....	329,949.05	4,451,153.44	52,069.58	309,103.44	277,889.47	4,142,050.00
Uncompahgre.....	141,243.28	8,132,588.83	90,498.39	1,398,614.72	60,744.89	6,733,944.11
Idaho:						
Boise.....	780,260.37	15,985,438.42	686,608.60	4,237,131.85	73,651.77	11,748,308.57
King Hill.....	373,484.18	1,988,523.89	35,737.71	103,496.26	337,746.47	1,885,025.63
Minidoka.....	909,814.89	9,900,691.13	784,230.87	5,124,961.81	125,584.02	4,775,729.32
Kansas: Garden City.....		390,495.54	363.50	58,002.27	\$ 363.50	332,493.27
Montana:						
Huntley.....	39,740.20	2,420,880.04	55,100.65	762,871.23	\$ 15,360.45	1,658,008.81
Milk River.....	228,058.26	7,221,832.02	35,572.90	847,345.08	192,485.46	6,874,486.99
Sun River.....	250,443.19	4,650,012.70	31,217.63	433,636.00	219,225.56	4,216,376.70
Montana-North Dakota:						
Lower Yellowstone.....	114,612.31	4,040,218.62	20,472.78	299,525.49	94,139.53	3,740,693.13
Nebraska-Wyoming:						
North Platte.....	1,156,383.23	16,491,803.84	360,342.91	3,682,415.94	796,040.32	12,809,387.90
Nevada: Newlands.....	424,595.83	8,543,663.74	169,276.49	1,606,105.20	255,319.34	6,934,548.54
New Mexico:						
Carlsbad.....	33,711.86	1,950,750.07	143,464.57	889,470.95	\$ 109,752.71	1,061,279.12
Hondo.....		406,744.36		34,841.70		371,902.66
New Mexico-Texas: Rio Grande.....	866,386.47	14,609,757.62	302,464.66	2,117,191.84	563,921.81	12,492,565.78
North Dakota:						
Buford-Trenton.....	\$ 959.54	311,229.60	26.00	17,432.93	\$ 965.54	293,796.67
Williston.....	74,583.87	1,211,624.19	52,345.33	412,450.03	22,238.64	799,174.16
Oregon: Umatilla.....	114,963.84	3,405,897.00	90,694.37	824,264.61	24,269.47	2,581,632.39
Oregon-California: Klamath.....	500,207.55	4,877,204.65	138,081.71	1,224,499.68	362,125.84	3,652,704.97
South Dakota: Belle Fourche.....	44,790.21	4,613,579.02	37,500.14	1,078,483.76	7,290.07	3,535,096.26
Utah: Strawberry Valley.....	40,423.90	4,186,740.62	178,222.61	1,128,320.75	\$ 137,798.71	3,058,419.87
Washington:						
Okanogan.....	67,169.89	1,828,633.25	82,743.93	424,130.57	\$ 15,574.04	1,404,502.68
Yakima.....	1,238,392.52	15,497,451.79	657,018.49	6,018,561.23	581,374.03	9,478,890.56
Wyoming:						
Riverton.....	478,505.57	1,331,697.01	7,449.84	27,479.02	469,055.73	1,304,217.99
Shoshone.....	893,702.04	9,485,609.97	80,010.66	1,271,764.92	782,691.38	8,213,845.05
Secondary (including Deschutes, Imperial Valley, and Baker).....	271,153.29	1,996,642.38	88,396.58	575,028.64	182,756.71	1,420,613.74
Denver office (net not transferred to projects) <sup>3</sup> .....	\$ 7,608.25	201,906.21	16,836.44	126,449.41	\$ 24,444.69	75,456.80
Field legal (net not transferred to projects) <sup>4</sup> .....	4,383.65	11,140.23	2,491.02	2,610.89	1,892.63	8,529.34
Washington office (net not transferred to projects) <sup>5</sup> .....	22,891.54	357,696.54	29,955.22	287,702.91	\$ 7,063.68	69,993.63
Indian projects <sup>6</sup> .....		2,997,829.24		2,997,829.24		
Civil-service retirement fund (unabsorbed) <sup>7</sup> .....	4,853.11	6,001.73			4,853.11	6,001.73
Total.....	9,853,094.45	181,726,457.22	5,143,928.41	46,495,363.35	4,709,166.04	135,231,093.87

<sup>1</sup> Expenditures from reclamation fund, increase of compensation, judgments, court of claims, Rio Grande Dam appropriation and Wind River Indian (Riverton). Amounts given for each project include net (transfers from other projects less transfers to other projects).

<sup>2</sup> Collections creditable to increase of compensation and Rio Grande Dam appropriation are included in the expenditure column as contra. Other collections are shown separately.

<sup>3</sup> Contra.

<sup>4</sup> See following analysis.

<sup>5</sup> Expended for Bureau of Indian Affairs from reclamation fund and later reimbursed by congressional appropriation.

<sup>6</sup> Analysis of civil-service retirement fund:

Transferred from reclamation fund to civil-service retirement fund..... \$71,785.00

Deducted from pay of employees..... 65,783.27

Unabsorbed balance..... 6,001.73

TABLE 14.—*Voucher transactions, all funds, and net investments, as of June 30, 1923 reclamation fund projects, including Wind River Indian (Riverton)*—Continued.

## ANALYSIS OF EXPENDITURES AND INVESTMENT BY FUNDS.

Item.	Expenditures.		Collections.		Net investment.	
	Fiscal year 1921.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
Reclamation fund.....	\$9,583,596.95	\$177,338,573.46	\$5,143,928.22	\$46,404,377.70	\$4,439,668.73	\$130,844,195.76
Increase of compensation (net) <sup>†</sup> .....	268,527.81	2,477,374.49	.....	.....	268,527.81	2,477,374.49
Judgments, Court of Claims.....	.....	550,347.58	.....	.....	.....	550,347.58
Rio Grande Dam appropriation.....	.....	1,000,000.00	.....	.....	.....	1,000,000.00
Wind River Indian (Riverton).....	969.69	360,161.69	.19	985.65	969.50	359,176.04
Total.....	9,853,094.45	181,726,457.22	5,143,928.41	46,495,363.35	4,709,166.04	135,231,038.47

<sup>†</sup> Includes \$17,761.73 increase of compensation, Wind River Indian (Riverton).<sup>†</sup> NOTE.—Denver, Washington, and field legal offices investment represents under or over distributed expenditures to projects analyzed as follows:

	Denver. <sup>a</sup>		Field legal. <sup>a</sup>		Washington.	
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
Reclamation fund:						
Disbursements.....	\$192,835.93	\$1,304,043.22	\$36,292.14	\$483,506.73	\$226,220.42	\$4,967,208.60
Less—						
Net transfers.....	196,736.50	1,102,121.59	32,250.56	472,598.56	189,616.65	4,500,238.06
Collections.....	17,156.50	126,449.41	2,170.96	2,610.90	20,955.22	287,702.91
Total.....	213,893.00	1,224,571.00	34,421.52	475,209.45	219,571.87	4,686,940.97
Net investment.....	<sup>a</sup> 21,067.07	75,472.22	1,870.62	8,207.24	6,648.55	80,267.63
Increase of compensation:						
Disbursements.....	11,649.85	82,553.54	1,480.00	2,432.08	15,789.50	90,717.40
Less—						
Net transfers.....	14,318.43	77,130.58	1,356.12	2,072.68	23,652.03	89,303.01
Collections.....	715.65	5,438.38	102.26	127.34	849.79	6,688.39
Total.....	15,034.06	82,568.96	1,461.38	2,300.02	24,501.82	95,991.40
Net investment.....	<sup>a</sup> 3,394.23	<sup>a</sup> 15.42	18.62	232.06	<sup>a</sup> 8,712.28	<sup>a</sup> 5,274.00
Investment, all funds.....	<sup>a</sup> 24,441.30	75,456.40	1,889.24	8,529.34	<sup>a</sup> 2,063.68	74,963.63

<sup>a</sup> Contra.<sup>a</sup> Field legal previously included in Denver office.

TABLE 15.—Voucher transactions and net investment as of June 30, 1923, other than reclamation fund projects.

	Expenditures.		Collections.		Net investment.	
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
<b>Mesa division, Yuma project:</b>						
Auxiliary.....	\$174,015.97	\$675,588.43	\$194,845.45	\$752,125.21	\$320,829.48	\$876,536.78
Increase of compensation fund (net).....	1,879.17	14,341.55			1,879.17	14,341.55
<b>Total.....</b>	<b>175,895.14</b>	<b>690,929.98</b>	<b>194,845.45</b>	<b>752,125.21</b>	<b>\$ 18,950.31</b>	<b>\$ 62,195.23</b>
<b>Drainage and cut-over fund:</b>						
Increase of compensation fund (net).....		100,279.59		464.51		99,815.08
		728.94				728.94
<b>Total.....</b>		<b>101,008.53</b>		<b>464.51</b>		<b>100,544.02</b>
<b>General investigations, Reclamation Service, 1923-Dec. 31, 1924, fund:</b>						
.....	16,408.24	16,408.24			16,408.24	16,408.24
Increase of compensation fund (net).....	304.81	304.81			304.81	304.81
<b>Total.....</b>	<b>16,713.05</b>	<b>16,713.05</b>			<b>16,713.05</b>	<b>16,713.05</b>
<b>Indian projects (Montana):</b>						
<b>Blackfoot—</b>						
Indian funds.....	50,663.06	1,248,780.37	13,906.08	52,858.32	36,756.98	1,195,902.05
Increase of compensation fund (net).....	2,662.36	14,227.21			2,662.36	14,227.21
Judgments, Court of Claims.....		29.91				29.91
<b>Total.....</b>	<b>53,325.42</b>	<b>1,263,017.49</b>	<b>13,906.08</b>	<b>52,858.32</b>	<b>39,419.34</b>	<b>1,210,159.17</b>
<b>Flathead—</b>						
Indian funds.....	364,388.50	5,029,402.91	46,626.86	229,378.70	321,761.64	4,800,024.21
Increase of compensation fund (net).....	8,401.32	145,104.27			8,401.32	145,104.27
<b>Total.....</b>	<b>372,789.82</b>	<b>5,174,507.18</b>	<b>46,626.86</b>	<b>229,378.70</b>	<b>330,162.96</b>	<b>4,945,128.48</b>
<b>Fort Peck—</b>						
Indian funds.....	16,741.90	906,963.52	1,672.05	25,389.17	15,069.85	881,574.35
Increase of compensation fund (net).....	1,069.15	17,245.28			1,069.15	17,245.28
Judgments, Court of Claims.....		163.34				163.34
<b>Total.....</b>	<b>17,811.05</b>	<b>924,372.14</b>	<b>1,672.05</b>	<b>25,389.17</b>	<b>16,139.00</b>	<b>898,982.97</b>

<sup>1</sup> Actual collections during year..... \$121,760.35  
Land sales to June 30, 1922, transferred to project accounts..... 73,085.10

**Total.....** 194,845.45

<sup>2</sup> Centra.



# DISCUSSION OF PROJECTS.

## PRIMARY PROJECTS.

### ARIZONA, SALT RIVER PROJECT.

C. C. CRAGIN, Salt River Valley Water Users' Association, general superintendent and chief engineer, Phoenix, Ariz.

[The operation of the Salt River project was turned over to the water users on November 1, 1917. The Bureau of Reclamation desires to express its appreciation of the co-operation of the Salt River Valley Water Users' Association in furnishing the following statement concerning the operations of the project during the fiscal year.]

The Salt River project is situated in Maricopa and Gila counties, Arizona, and is populated by 80,000 people living on some 5,000 farms and in 14 towns. The water supply is from the Salt and Verde Rivers, augmented by wells located in various parts of the valley. Records show an average annual rainfall of 8.34 inches over a period of 35 years and a range of temperature from 22° to 117° F. The soil is sandy loam and silt and the length of the irrigation season is 365 days, October 1 to September 30. The principal crops raised on the project are alfalfa, cotton, grain, and citrus and deciduous fruits, and marketing points are Phoenix and other Arizona towns, Pacific coast cities, and the eastern market.

The Roosevelt Reservoir, created by the building of Roosevelt Dam at the confluence of Tonto Creek and Salt River, is 70 miles northeast of Phoenix. The stored water is carried down the Salt River to the Granite Reef diversion dam, which is situated approximately 4 miles below the mouth of the Verde River, where, together with such water as may be discharged from the Verde, it is diverted to the north and south side canal systems. The water supply of the canals on the north side of the Salt River is further augmented by the water diverted at Joint Head diversion dam. There are now 8 pumping plants in operation, with an approximate capacity of 9 second-feet each, 81 pumping plants with capacities ranging from 1 to 4 second-feet, and 1 pumping plant with 100 second-feet capacity for lifting water 40 feet above the gravity system. The present canal and lateral system comprises 872 miles, together with 155 miles of waste ditches, 4.85 miles of open drains, and 5.30 miles of closed drains. Power is generated at the Roosevelt power plant from the stored water. There are four other power plants at various locations on the project—the South Consolidated, Arizona Falls, Cross Cut, and Chandler. The power derived from these plants is used for pumping water for irrigation, drainage, and for commercial purposes.

### SUMMARY OF DATA FOR SALT RIVER PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage of project on completion.....	213,170	
Public land entered to June 30, 1923.....	16,170	
Private land, June 30, 1923.....	197,000	
Acreage irrigated, season of 1922.....	304,590	
Acreage cropped under irrigation, season of 1922.....	189,184	
Value of irrigated crops, season of 1922.....	\$15,407,141.00	
Value of irrigated crops per acre cropped.....	\$81.90	
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations \$5,000		
Unencumbered balance, June 30, 1923.....	\$5,000	
Fiscal year 1924, amount specified in appropriation act.....	\$5,000	

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....		\$10,548,119.28
Less—		
Loss.....	\$83.14	382,097.31
Water-right contracts.....		10,166,021.97
Penalties.....	\$83.14	
		10,548,119.28

<sup>1</sup> Contra.

*Summary of data for Salt River project to end of fiscal year 1923—Continued.*

Investment to date.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursement and net transfers.....	\$14,662,083.96	\$9,450.28	\$14,671,484.24
Less collections.....	5,041,492.86		5,041,492.86
Net investment June 30, 1923.....	9,620,541.10	9,450.28	9,629,991.38

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.	
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
To return net construction cost:				
Water-right charges.....	\$332,961.32	\$332,961.32	\$276,244.19	\$332,961.32
Construction charges paid in advance.....			4,854.50	4,854.50
Revenues:				
Rentals of irrigating water.....		2,246,726.01		2,246,726.01
Rentals of power and light.....		993,411.03		993,411.03
Rentals of grading and farming lands.....		19,373.14		19,373.14
Total.....		3,264,510.18		3,264,510.18
Other miscellaneous collections.....			26,228.94	885,166.86
Grand total collections.....			307,327.63	5,041,492.16

<sup>1</sup> Adjustment of charges due.**ACTIVITIES DURING FISCAL YEAR.**

The past year has seen notable progress in project development. The waste ditch program is two-thirds complete, 43.5 miles of new ditches having been built, making a total of 155 miles. New irrigation laterals totaling 8.7 miles were added to the distribution system, and 1.5 miles of closed drain were constructed for drainage, the aggregate length of canals, ditches, and drains maintained by the project being 1,037 miles. There were installed 9,922 linear feet of culverts on waste ditches and laterals. Four additional drainage wells were put in operation, totaling 1,028 feet in depth.

Work on the enlargement of the Eastern canal to carry 1,500 second feet was practically finished. The water for the Consolidated canal will be supplied to it at the end of this enlarged section of the Eastern through the new power plant (now about 60 per cent complete) at this point, thus permitting the abandonment of the portion of the Consolidated above the new plant seriously menaced from floods of the Salt River.

A long-standing menace has been removed by the completion of the Cave Creek flood-control dam, a multiple-arch concrete structure 1,700 feet long and 60 feet high, costing over \$550,000, of which \$116,000 was contributed by the water users' association.

Considerable progress has been made in the improvement of the power system, the plans for the extension of which contemplate the ultimate expenditure of \$6,000,000 for approximately 50,000 horsepower. In the existing system many serious sources of interruption in service have been eliminated. At Roosevelt there were installed current limiting reactors in the main leads of the 1,500 KVA gener-

ators, new induction type relays for all generator oil circuit breakers, and lead-covered cables for transformer leads. A spare 350 KVA transformer was purchased. At the Cross-cut plant the main leads of all generators were changed to lead-covered single-conductor cables, the buckets were renewed on the No. 6 Pelton wheel, and two 225-kilowatt frequency changers were installed to supply current to the town of Tempe. All suspension type insulators were tested on the 40,000-volt lines and 754 faulty units replaced with new.

A bond issue of \$1,800,000 was sold by the association to provide funds for the first part of the power extension program known as Mormon Flat Development No. 1 consisting of the increase of 270,000 acre-feet in the capacity of Roosevelt Reservoir by the installation of gates in the spillways (recently completed), the construction of the 200-foot Mormon Flat Dam creating 90,000 acre-feet storage for regulating purposes (construction well under way), and the installation of an additional 7,500 KVA generating unit at Roosevelt.

*Operation data, Salt River project.*

Item.	1920-21	1921-22	1922-23
Acreage for which works were prepared to supply water .....	213,000	213,168	213,170
Acreage irrigated .....	203,060	203,346.50	204,590.50
Miles of canals operated .....	852.75	863.35	863.35
Water diverted (acre-feet) .....	<sup>1</sup> 1,371,983	1,231,031	<sup>2</sup> 1,215,035
Water delivered to land (acre-feet) .....	594,615	534,526.07	.....
Acre-feet per acre for area under cultivation .....	2.90	<sup>2</sup> 2.635	<sup>2</sup> 2.770

<sup>1</sup> Includes 307,455 acre-feet wasted; water for Salt River Valley Water Users' system only; outside water deducted.

<sup>2</sup> Net Salt River Valley Water Users' Association, inclusive of 185,000 acre-feet flood water diverted for power.

<sup>3</sup> Amount of water per acre actually charged for; 20 per cent less than the amount of water delivered to the land.

*Settlement data, Salt River project.*

Item.	1920	1921	1922
Total number of farms on project (when completed) .....	<sup>1</sup> 4,700	5,000	5,000
Number of farms reported .....	<sup>1</sup> 4,200	5,000	5,000
Population .....	<sup>2</sup> 31,600	33,600	36,000
Number of towns .....	14	14	14
Population .....	39,795	42,500	44,000
Total population of towns and farms .....	71,395	76,100	80,000
Number of public schools .....	57	60	60
Number of churches .....	62	65	65
Number of banks .....	20	20	20
Total capital stock of banks .....	\$1,752,500.00	\$1,755,500	\$1,755,500
Amount of deposits .....	\$24,426,056.95	\$17,776,336	\$21,331,600
Number of depositors .....	<sup>1</sup> 35,000	38,000	39,500

<sup>1</sup> Estimated.

<sup>2</sup> Includes population within town-site areas.

## ARIZONA-CALIFORNIA, YUMA PROJECT.

PORTER J. PRESTON, project manager, Yuma, Ariz.

The Yuma project, exclusive of the Mesa division, comprises 65,000 acres of irrigable land for a distance of 28 miles from the boundary between Arizona and Mexico, in Yuma County, Ariz., and Imperial County, Calif. The water supply is diverted from the Colorado River at Laguna Dam 10 miles northeast of Yuma on the California side and is carried under the river at Yuma by an inverted siphon. Building charges are \$55, \$66, \$75, \$77, and \$90 per acre for gravity lands. The limit of area of farm units is 40 acres. The duty of water averages 3 acre-feet at the farm. The soils are rich alluvium bottom land. The principal crops are cotton and alfalfa. The irrigation season is 365 days. The average temperatures for 29 years are: High, 115°; low, 28°; rainfall, 40-year average, 3.1 inches.

The Mesa division comprises about 45,000 acres of mesa land lying about 80 feet above the valley. The soil is sandy, the climate frostless and well adapted to the growing of citrus fruit and other semitropical plants. Water is to be supplied by pumping. The first unit of 6,300 acres is now being developed.

### SUMMARY OF DATA FOR YUMA PROJECT TO END OF FISCAL YEAR 1923.

Areas and crops:		
Irrigable acreage when project is complete.....		110,000
Public land entered to June 30, 1923.....	17,493	
Public land open to entry June 30, 1923.....	853	
Public land withdrawn on June 30, 1923.....	33,284	
Indian land June 30, 1923.....	8,200	
Private land June 30, 1923.....	50,170	
Acreage bureau could supply season of 1922.....		67,200
Acreage irrigated season of 1922.....		54,779
Acreage cropped under irrigation season of 1922.....		53,970
Value of irrigated crops season of 1922 (crop census).....		\$2,682,500
Value of irrigated crops per acre cropped.....		\$49.70
Finances:		
Appropriations—		
Fiscal year 1923—amount of congressional authorizations.....	\$600,913.19	
Disbursements and liabilities.....	435,044.02	
Unencumbered balance June 30, 1923.....		\$165,869.17
Fiscal year 1924 amount specified in appropriation act.....		\$430,000.00

	Fiscal year 1923.	To June 30 1923.
Irrigation works:		
Net construction cost.....	\$84,380.70	\$0,026,572.84
Less—		
Funds advanced.....		101,113.89
Water-right contracts: Project lands 56,568 acres.....	31,113.75	5,642,460.28
Total.....	31,113.75	5,743,583.17
Balance.....	53,275.95	3,282,989.67

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$238,813.90	\$1,515,443.58	\$263,211.29	\$1,667,634.07
Less:				
Charges billed or contracted.....	234,253.92	1,114,502.45	235,559.45	1,120,280.38
Penalties.....	6,847.81	14,955.45	13,536.00	25,198.31
Discounts.....	2,923.54	9,116.41	4,347.96	13,302.90
Total.....	28,178.19	1,120,341.49	244,747.49	1,132,169.79
Balance.....	655.71	395,102.09	18,463.80	535,764.88

Contra.

*Summary of data for Yuma project to end of fiscal year 1923—Continued.*

Investment, to date.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	11,929,446.84	142,635.65	12,072,082.49
Less collections.....	8,029,643.57		3,029,643.57
Net investment June 30, 1923.....	3,899,803.27	142,635.65	9,042,438.92

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1924.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
<b>To return net construction cost:</b>						
Funds advanced.....		\$101,113.89		\$101,113.89		
Water right charges.....	\$168,372.26	1,054,025.33	\$158,666.89	979,436.82	\$1,152.57	78,466.24
<b>Total.....</b>	<b>168,372.26</b>	<b>1,155,139.22</b>	<b>158,666.89</b>	<b>1,080,550.41</b>	<b>1,152.57</b>	<b>73,436.24</b>
Charges paid in advance.....			6,764.46	11,202.22	146.81	
<b>To return net operation and maintenance costs:</b>						
Operation and maintenance charges—						
Project lands (63,163 acres).....	235,559.45	1,120,280.38	249,381.48	923,705.72	17,315.37	179,259.29
Charges paid in advance.....			3,091.73	3,951.23	59.35	
Penalties and interest.....			13,520.31	24,902.02	290.29	
<b>Revenues:</b>						
Rentals of irrigating water.....	33,231.33	495,992.84	30,429.09	490,848.77	292.01	4,832.06
Rentals of grazing and farming lands.....	2,531.99	11,856.10	3,010.54	11,670.93		185.17
<b>Total.....</b>	<b>35,763.32</b>	<b>507,848.94</b>	<b>33,439.63</b>	<b>502,519.70</b>	<b>292.01</b>	<b>5,017.23</b>
Miscellaneous uncollected. Other miscellaneous collections (reclamation fund).....			41,577.97	482,812.27		11,924.65
<b>Grand total collections.....</b>			<b>501,442.47</b>	<b>3,029,643.57</b>		

Uncollected construction water right charges as of June 30, 1923, 7 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 16 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

Construction on the main project was confined principally to drainage work; 4.4 miles of open drain were dug, involving the excavation of 121,200 cubic yards of earth. There were practically no seeped lands during the fiscal year.

All cleaning of the lateral system was done by machinery, four Ruth ditch cleaners being used for this purpose; it has also been found possible to use these machines on most of the main canals, replacing draglines at a considerable reduction in cost. By an arrangement with the water users' association, these machines were also made available for cleaning private ditches at cost. A total of 170.3 miles of canals were cleaned during the year. On September 2 a heavy rain damaged the main canal at the crossing of the Picacho wash, causing an expense of \$15,000.

Construction work on the Mesa division consisted of the extension of the B-Main Canal a distance of 2.5 miles, the construction of 2.4 miles of earth laterals, the casting of 34,800 linear feet of concrete pipe, the laying of 9,500 linear feet of pipe laterals, and the construction of concrete turnouts; the season's work, which extends into the fiscal year 1924, will bring about 2,300 acres under water, making a total of 4,800 acres for which water is available. Public notice covering 454 acres was issued, making a total of 2,900 acres under public notice.

### CROPS AND DEVELOPMENT.

The year was an improvement over the preceding one from an agricultural standpoint. Prices for cotton and alfalfa were such as to show better net returns to the growers; and the gross return from the cropped area was nearly 25 per cent greater than for the previous year. Spring crop prospects were excellent; it appeared that both the alfalfa seed and cotton crops would be good, with very fair prices. Considerable interest was aroused in live stock and dairying and a start was made at growing winter vegetables. The latter effort was not entirely successful on account of poor marketing arrangements, but most of the growers felt that there was a good prospect of success along this line and were determined to make another attempt during the coming winter. It has been demonstrated that vegetables of very fine quality can be grown, and if the crop can be properly marketed there is every prospect that a successful industry can be built up.

During the latter part of the year a campaign was begun to bring in new settlers and cut down some of the larger holdings to smaller farms which can be worked intensively.

### Operation data, Yuma project, by calendar years.

Item.	1917	1918	1919	1920	1921	1922
Area for which bureau was prepared to supply water.....	73,000	73,000	170,000	145,000	145,000	67,200
Acres irrigated.....	36,956	45,670	53,284	54,550	52,400	55,770
Miles of canal operated.....	335	338	323.2	323.2	323.2	334.2
Water diverted (acre-feet) <sup>1</sup> .....	337,597	314,900	478,186	468,900	483,000	546,634
Water delivered to land (acre-feet).....	136,541	150,229	155,417	160,330	140,900	140,307
Acre-feet to acre for area under cultivation.....	3.7	3.3	2.9	2.94	2.69	

<sup>1</sup> Reduction due to exclusion of North Gila Valley land and lands along levee subject to seepage.

<sup>2</sup> Of the water diverted, from 100,000 to nearly 200,000 acre-feet each year are wasted, of which the largest part flows into the Colorado River at the Colorado spillway above Yuma, and this water can be diverted for irrigation farther down the river.

### Settlement data, Yuma project.

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project (when completed).....	4,000	4,000	5,190	5,750	5,750	5,750
Number of farms reported.....	900	1,185	1,225	1,230	1,211	1,216
Population.....	2,700	4,300	5,000	5,100	4,800	4,200
Number of towns.....	6	6	6	6	6	6
Population.....	6,735	7,599	7,690	7,110	6,665	6,700
Total population of towns and farms.....	9,435	11,890	12,600	12,210	11,465	10,900
Number of public schools.....	20	20	18	15	16	20
Number of churches.....	9	10	11	13	13	14
Number of banks.....	4	4	6	6	5	5
Total capital stock.....		\$175,000	\$255,000	\$255,000	\$230,000	\$280,000
Amount of deposits.....		\$1,321,468	\$1,923,287	\$2,100,000	\$1,927,000	\$3,065,800
Number of depositors.....		4,572	5,288	9,175	5,900	6,382

<sup>1</sup> Reduction due to consolidation.

<sup>2</sup> Religious organizations: figures prior to 1920 relate to church buildings.

## CALIFORNIA, ORLAND PROJECT.

R. C. E. WEBER, project manager, Orland, Calif.

The Orland project is located in Glenn and Tehama Counties, with reservoir in Colusa County. Stony Creek, the source of the water supply, has a drainage area of 735 square miles above the project diversion dams; the annual mean run-off near Fruto is 405,000 acre-feet.

The average elevation above sea level is 250 feet; the mean rainfall, 18.4 inches; and the temperature range, 21° to 114° F. The soil is sandy and gravelly loam, silt loam, and clay loam. The principal products are alfalfa, milo, citrus, and other fruits, nuts, and vegetables. The limit of area of farm units is 40 acres, except that original subscribers are qualified to hold up to 160 acres.

The irrigation plan provides for storage at East Park reservoir on Little Stony Creek with a feed canal 7 miles long connecting the reservoir with Stony Creek. For the irrigation of project lands located in the vicinity of Orland, water is diverted from Stony Creek by two diversion weirs into the South and North Canals, which serve 14,600 and 6,100 acres of land, respectively. Stored water from the reservoir is conveyed in the natural channel of Stony Creek to the project diversions. The distribution system consists of 2,000 structures and 146 miles of canals and laterals, 80 miles of which are concrete lined. The plan also includes a high-line canal, from which power may be developed for pumping. The present limits may be considered as a division of the Sacramento Valley project. It may be extended by constructing additional reservoirs on Stony Creek, the most feasible of which appears to be Millsite, near Fruto.

### SUMMARY OF DATA FOR ORLAND PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....	20,665
Private land, June 30, 1923.....	20,665
Acreage irrigated, season of 1923.....	15,119
Acreage cropped under irrigation, season of 1923.....	11,803
Acreage dry-farmed, season of 1923.....	300
Value of irrigated crops, season of 1923.....	\$565,560
Value of irrigated crops per acre cropped.....	\$47.92
Value of dry-farmed crops, season of 1923.....	\$3,000
Value of dry-farmed crops per acre cropped.....	\$10

#### Finances:

Appropriations—	
Fiscal year 1923, amount of congressional authorizations.....	\$132,665.05
Disbursements and liabilities.....	80,682.02
Unencumbered balance June 30, 1923.....	\$51,986.03
Fiscal year 1924, amount specified in appropriation act.....	\$50,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$33,836.74	\$1,091,795.87
<b>Less—</b>		
Funds advanced.....	\$ 621.23	
Water-right contracts—		
Project lands (19,398.25 acres).....	3,371.50	1,066,903.75
Other lands (approximately 775.8 acres) <sup>1</sup> .....	42,669.00	42,669.00
Returns pledged millsite investigations <sup>4</sup> .....	10,000.00	10,000.00
Total.....	55,419.27	1,119,572.75
Balance.....	\$ 21,582.53	\$ 27,776.88

<sup>1</sup> Includes 320 acres vested rights, 144 acres town, and 27 acres school sites.

<sup>2</sup> Contra.

<sup>3</sup> Includes lands paying charges but not covered by water-right contracts.

<sup>4</sup> Pledged by Orland Unit Water Users' Association in 1921.

*Summary of data for Orland project to end of fiscal year 1923—Continued.*

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost .....	\$35,319.01	\$200,510.23	\$38,575.24	\$218,610.67
Less—				
Charge billed or contracted .....	37,725.63	210,932.07	37,725.63	210,932.07
Penalties .....	2.63	33.70	6.70	37.77
Discounts (contra) .....	1,834.49	10,398.83	1,835.33	10,399.67
Total .....	35,893.77	200,566.94	35,897.00	200,570.17
Balance .....	\$ 574.76	\$ 56.71	2,678.24	18,040.50
Investment to date.		Reclamation fund.	Increase of compensa- tion (net).	Total.
Disbursements and net transfers .....		\$1,450,238.85	\$28,253.95	\$1,478,492.80
Less collections .....		599,502.60		599,502.60
Net investment, June 30, 1923 .....		\$80,736.25	28,253.95	\$78,990.20

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced .....	\$621.23		\$621.23			
Water-right charges .....	66,566.00	\$235,229.42	66,566.00	\$235,229.42		
Total .....	65,944.77	235,229.42	65,944.77	235,229.42		
Charges paid in advance .....				5,385.16		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (20,174.05 acres) ..	37,725.63	210,932.07	35,781.89	200,313.78	\$10,399.67	\$218.62
Penalties and interest ..			6.70	37.77		
Revenues:						
Rentals of irrigating water .....	229.50	120,384.00	229.50	120,384.00		
Rentals of grazing and farming lands .....		32.00		32.00		
Total .....	229.50	120,416.00	229.50	120,416.00		
Other miscellaneous collections (Reclamation fund) ..			4,011.97	38,120.47		
Grand total collections .....			105,974.83	599,502.60		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, none.

Uncollected operation and maintenance charges as of June 30, 1923, 0.0047 per cent of total accruals for 1923, or 0.001 per cent of total to date.

**ACTIVITIES DURING FISCAL YEAR.**

Construction work consisted largely of placing 77,919 square yards of concrete lining on 9.1 miles of canals and laterals under supplemental construction. A number of minor structures were also built. Surveys and investigations in connection with the proposed development of additional storage on Stony Creek at



Millsite, which were undertaken at the request of the Board of Directors of the Orland Unit Water Users' Association and which were in progress at the beginning of the fiscal year, were concluded and a report was submitted to the board which referred the subject to the shareholders of the association at the annual election held in February, 1923. The shareholders by a decisive vote declined to accept an increased building charge for additional storage. The installation of an additional auxiliary outlet gate at East Park dam, designed to eliminate operating the original gates under high heads, constituted the largest item of maintenance work.

### CROPS AND LIVE STOCK.

Ample water supply for the project was available and the year was one of good crop yields and favorable agricultural conditions.

A total of 15,119 acres or 75 per cent of the project area was irrigated during the season of 1922, representing an increase of 422 acres over the preceding season. Thirty new farms were brought under irrigation. The increased area consists largely of orchards, as alfalfa, although continuing to be the predominating crop on the project, is stationary in acreage. Shipments of orchard products assumed large proportions, six and one-half cars of almonds and six cars of oranges being forwarded. Prices for farm products were fairly remunerative, which together with good yields resulted in an average gross crop value of \$47.92 per acre. The dairy industry on the project showed a substantial growth during the year, both in number and quality of cows. Bank deposits showed an increase of \$99,000.

*Operation data, Orland project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	20,533	20,533	20,533	20,657	20,665
Acreage irrigated.....	14,764	15,203	13,872	14,697	15,119
Miles of canal operated.....	138	138	138	146	146
Water stored (acre-feet).....	46,900	51,000	62,000	13,680	63,460
Water diverted (acre-feet).....	45,900	72,000	33,800	68,867	76,632
Water delivered to land (acre-feet).....	28,300	45,000	20,600	44,200	50,590
Per acre of land irrigated (acre-feet).....	1.91	2.95	1.49	3.01	3.34

<sup>1</sup> Includes 320 acres of vested water rights and 46 acres of town and school sites.

<sup>2</sup> Includes 320 acres of vested water rights and 162 acres of school and town sites.

<sup>3</sup> Includes 320 acres of vested rights and 171 acres of school and town sites.

### Settlement data, Orland project.

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	725	846	908	936	968
Population.....	2,000	2,250	2,200	2,250	2,275
Number of irrigated farms.....	593	602	644	663	693
Operated by owners or managers.....	549	549	592	589	568
Operated by tenants.....	44	53	52	74	125
Population.....	1,589	1,768	1,844	1,892	1,909
Number of towns.....	1	1	1	1	1
Population.....	1,600	1,700	1,700	1,700	1,700
Total population.....	3,600	3,950	3,900	3,950	3,975
Number of public schools.....	9	10	10	10	10
Number of churches.....	7	7	7	7	7
Number of banks.....	2	2	2	2	2
Total capital stock.....	\$141,000	\$141,000	\$171,000	\$171,000	\$171,000
Amount of deposits.....	\$950,000	\$1,100,000	\$1,020,600	\$896,000	\$995,000
Number of depositors.....	2,800	3,000	2,900	2,800	2,900

## COLORADO, GRAND VALLEY PROJECT.

S. O. HARPER, project manager, Grand Junction, Colo.

The Grand Valley project is located in Mesa County, Colo., on the main line of the Denver & Rio Grande Western Railroad. The principal project towns and estimated population are Grand Junction, 9,000; Fruita, 1,200; and Palisade, 900.

The irrigation plan provides for the diversion of water from the Colorado River, by means of a dam about 8 miles northeast of Palisade, Colo., into a canal system on the north side of the river, for the irrigation of 45,000 acres of land along the north boundary of the Grand Valley. When the project is completed about 35,000 acres will be supplied by gravity and 10,000 acres by electrically-operated pumping plants to be located on the gravity canal. Water service is also furnished through the project system to 8,400 acres of land in the Palisade and Mesa County irrigation districts, and works are now under construction to supply the Orchard Mesa Irrigation District, which includes 10,000 acres of land on the south side of the valley, known as the Orchard Mesa pumping division.

The average elevation of the irrigable area is 4,700 feet, the average annual rainfall is 8.3 inches, and the average range of temperature is from 99° maximum to -7° minimum. The soils consist of red mesa, sandy loam, and adobe. The principal crops are alfalfa, sugar beets, grain, corn, fruit, potatoes, and vegetables.

The project has been completed far enough to supply 30,500 acres in the Gravity division, all lands in the Palisade and Mesa County irrigation districts, and 3,000 acres in the Orchard Mesa Irrigation District. No lands have been opened under public notice, and the project is now operated on a rental basis.

### SUMMARY OF DATA FOR GRAND VALLEY PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....	1 55,000
Public land entered to June 30, 1923.....	12,442
Public land open to entry on June 30, 1923.....	403
Public land withdrawn on June 30, 1923.....	12,319
Private land, June 30, 1923.....	28,845
Acreage bureau could supply, season of 1922.....	2 30,500
Acreage irrigated, season of 1922.....	2 12,372
Acreage cropped under irrigation, season of 1922.....	2 11,844
Value of irrigated crops, season of 1922.....	3365,760
Value of irrigated crops per acre cropped.....	\$30.88

#### Finances:

##### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$497,062.00
Disbursements and liabilities.....	404,398.64
Unencumbered balance, June 30, 1923.....	\$
Fiscal year 1924, amount specified in appropriation act.....	\$366,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$252,722.37	\$4,017,921.98
Less—		
Funds advanced.....	* 184.68	
Water-right contracts: Orchard Mesa Irrigation District.....	1,000,000.00	1,000,000.00
Total.....	999,843.37	1,000,000.00
Balance.....	* 747,120.00	3,017,921.98

	Reclamation fund.	Increase of compensa- tion (net).	Total.
<b>Investment to date:</b>			
Disbursements and net transfers.....	\$4,350,492.55	\$70,660.89	\$4,451,153.44
Less collections.....	309,103.44		309,103.44
Net investment, June 30, 1923.....	4,071,389.11	70,660.89	4,142,050.00

<sup>1</sup> Includes 10,000 acres in Orchard Mesa pumping division.

<sup>2</sup> Exclusive of lands in Palisade and Mesa County irrigation districts.

<sup>3</sup> Contra.

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced.....	\$156.63	.....	\$156.63	.....	.....	.....
Revenues:						
Rentals of irrigating water.	51,000.98	\$219,829.34	44,727.64	\$184,502.13	\$2,422.58	\$32,904.63
Rentals of grazing and farming lands.....	20.00	220.00	20.00	167.00	.....	62.00
Total.....	51,020.98	220,069.34	44,747.64	184,669.13	2,422.58	32,966.63
Miscellaneous uncollected.....	.....	.....	.....	.....	.....	165.00
Other miscellaneous collections (reclamation fund).....	.....	.....	7,468.57	124,434.31	.....	.....
Grand total collections.	.....	.....	52,056.58	309,108.44	.....	.....

<sup>1</sup> Contra.

#### ACTIVITIES DURING FISCAL YEAR.

*Gravity division.*—The principal construction work consisted of the digging of drainage ditches required to maintain the productivity of the lands under irrigation and to prevent the increase of seepage. Three dragline excavators were used on this feature during a part of the year, completing 5.57 miles of open drain, involving 117,782 cubic yards of excavation. On the lateral system a few small sublaterals were constructed and minor structures installed as required for making deliveries to new lands. Sixty minor wooden structures were installed in this work.

*Orchard Mesa pumping division.*—In accordance with the terms of contract with the Orchard Mesa Irrigation District, dated February 18, 1922, work was started on the rehabilitation of the irrigation system of the district. The outstanding bonded and other indebtedness was liquidated and construction work was started in September, 1922. The features completed during the fiscal year were the Colorado River siphon and wasteway (a reinforced concrete pipe 9 feet in diameter laid under the bed of the river), 850 linear feet of concrete flume of 800 second-foot capacity, and the reconstruction of 500 linear feet of the tunnel on canal No. 1. Water was turned through the siphon on May 10, 1923, and the district is now receiving its entire water supply from the project works.

*Operation and maintenance.*—The project irrigation system was operated without interruption during the season of 1922, although some difficulty was experienced in maintaining uniform deliveries during the fore part of the season on account of tumbleweeds blowing into the laterals on windy days. The irrigated acreage on the Gravity division amounted to 12,400 acres in addition to 8,400 acres in the Palisade and Mesa County irrigation districts.

**CROPS AND SETTLEMENT.**

The season of 1922 was favorable for the growth of nearly all crops and the yields in general were above the average. With the exception of potatoes, fair prices were received for most of the crops, alfalfa hay and sugar beets in particular giving good returns. The crop prospects for the season of 1923 were excellent and good prices were expected. The general feeling among the project farmers was much more optimistic than it was a year ago.

*Operation data, Grand Valley project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which bureau is prepared to supply water.	35,000	138,400	138,400	138,400	138,400
Acreage irrigated.	8,102	118,449	119,484	120,590	120,672
Miles of canals operated.	168	175	175	175	175
Water diverted, acre-feet.	74,352	1133,364	1142,527	1145,416	1166,404
Water delivered to land, acre-feet.	29,856	138,307	136,024	143,978	146,290
Per acre of land irrigated.	3.69	13.81	13.07	13.67	13.74

<sup>1</sup> Includes Palisade and Mesa County irrigation districts.

<sup>2</sup> Project lands only.

*Settlement data, Grand Valley project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project <sup>1</sup>	900	900	825	825	825
Population	759	894	1,019	1,064	1,134
Number of irrigated farms	317	324	376	402	387
Operated by owners or managers	186	201	251	264	217
Operated by tenants	131	123	125	138	170
Population	759	894	1,019	1,064	1,134
Number of towns <sup>2</sup>	6	6	6	6	6
Population <sup>2</sup>	10,700	11,266	11,415	11,246	11,246
Total population in towns and on farms <sup>2</sup>	11,459	12,150	12,434	12,310	12,380
Number of public schools <sup>2</sup>	20	22	23	23	24
Number of churches <sup>2</sup>	28	28	28	28	28
Number of banks <sup>2</sup>	7	7	7	7	7
Total capital stock <sup>2</sup>	\$432,000	\$432,000	\$465,000	\$465,000	\$468,700
Total amount of deposits <sup>2</sup>	\$3,030,621	\$3,743,714	\$3,259,780	\$3,621,420	\$3,520,500
Total number of depositors <sup>2</sup>	8,681	10,042	10,150	10,975	8,825

<sup>1</sup> Estimated.

<sup>2</sup> These items include area adjacent to project.

## COLORADO, UNCOMPAHGRE PROJECT.

L. J. FOSTER, project manager, Montrose, Colo.

The Uncompahgre project is in southwestern Colorado, in Montrose and Delta Counties, on the Denver & Rio Grande Western Railroad. The project towns and population are Montrose, 4,000; Olathe, 750; and Delta, 2,700.

The irrigation plan provides for the diversion of water from the Gunnison River by means of the Gunnison Tunnel, 5.8 miles long, and the South Canal, 11.7 miles long, to supplement the flow of the Uncompahgre River for the irrigation of lands in the Uncompahgre Valley. To distribute the waters of the Uncompahgre and Gunnison Rivers thus combined, the more important private canals taking water from the Uncompahgre River have been purchased, enlarged, and extended by the Government, and in addition high-line lateral and other systems have been constructed on each side of the valley.

The irrigation season extends from April 1 to October 31, 214 days, in all Government canals except the Loutsenhizer, under which the season extends to November 15.

The average elevation of the irrigable area is 5,500 feet above sea level; the average annual precipitation on the project for 21 years, 9.52 inches; and the average range of temperature, 10° to 95° F.

The soils of the irrigable area are red sandy gravel, adobe, and clay loams. The principal products are alfalfa, grain, fruits, sugar beets, potatoes, and other vegetables. The principal markets are Denver, Omaha, and Kansas City, and the West for live stock; Denver, Missouri River points, and Texas for fruit, potatoes, and onions.

The project is completed with the exception of the acquisition of a few private laterals.

### SUMMARY OF DATA FOR UNCOMPAHGRE PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		97,410
Public land entered to June 30, 1923.....	19,543	
Public land open to entry on June 30, 1923.....	1,364	
Public land withdrawn on June 30, 1923.....	673	
Private land on June 30, 1923.....	75,830	
Acreage bureau could supply, season of 1922.....		97,410
Acreage irrigated season of 1922.....		64,730
Acreage cropped under irrigation, season of 1922.....		61,601
Value of irrigated crops, season of 1922.....		\$1,530,900
Value of irrigated crops per acre cropped.....		\$25.14
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$287,888.96	
Disbursements and liabilities.....	166,833.12	
Unencumbered balance June 30, 1923.....		\$121,055.86
Fiscal year 1924, amount specified in appropriation act.....		\$185,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works—</b>		
Net construction cost.....	\$47,890.96	\$6,715,074.41
Less—		
Loss.....		47,370.81
Water-right contracts, project lands, 97,410 acres.....		6,713,584.50
Total.....		6,760,955.31
Balance.....	47,890.96	145,880.96
Net operation and maintenance cost <sup>1</sup> .....	81,724.16	81,724.16

<sup>1</sup> Contra.      <sup>2</sup> Project on public notice basis as of Jan. 1, 1923, for operation and maintenance.

Investment to date.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$8,040,763.51	\$91,795.32	\$8,132,558.83
Less collections.....	1,398,614.72		1,398,614.72
Net investment June 30, 1923.....	6,642,148.79	91,795.32	6,733,944.11

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected on June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
Water right charges.....	\$145,327.50	\$146,261.80	\$23,186.08	\$29,098.88	\$14,497.08	\$102,665.34
Charges paid in advance.....			11,735.99	39.01	59,071.37	
To return net operation and maintenance cost: Charges paid in advance.....			1,543.60	1,543.60		
Revenues:						
Rentals of irrigation water.....	10,531.97	1,182,776.10	58,366.39	1,186,568.52	9,835.02	86,251.96
Rentals of grazing and farming lands.....	45.00	152.00	45.00	152.00		
Miscellaneous uncollected.....						186.18
Other miscellaneous collections.....			9,114.40	231,192.71		
Grand total collections.....			90,498.39	1,398,614.72		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 70.2 per cent of total accruals.

### ACTIVITIES DURING FISCAL YEAR.

Construction work consisted in the extension, enlargement, and installation of minor structures on private laterals taken over by the bureau to be operated as part of the project system.

During the season of 1922 the bureau supplied and distributed water for the irrigation of 64,730 acres of land, of which 5,363 acres were supplied from the south lateral system, 5,382 acres from the west lateral system, 21,184 acres from the Montrose & Delta lateral system, 4,398 acres from the Loutsenhizer lateral system, 6,268 acres from the Selig lateral system, 15,022 acres from the Ironstone lateral system, 5,594 acres from the East lateral system, and 1,519 acres from the Garnet lateral system.

During the season 427,706 acre-feet of water were diverted into the canals operated by the bureau and 422,398 acre-feet were delivered to 1,624 farms.

Miscellaneous work was carried on in the Gunnison Tunnel during the winter of 1922-23 in improving and extending the concrete approaches to the short lined sections. The tunnel was shut off at three different periods during the fiscal year for periods of one day to five days in order to repair breaks and leaks in the lined section of the South canal.

### CROPS AND DEVELOPMENT.

Crops in general made a small per acre return for the year, the average for all crops being \$25.14. The yields per acre were slightly below the average, with the exception of apples and onions. The apple crop was more than double the average and the onion crop was 7 per cent above the average.

Project activities were going forward with considerable confidence despite the depression which resulted in 1922 from low prices for products and the lack of transportation to ship crops. Reasonable

returns for the 1923 crops will do much to restore confidence in the future of the project.

Better transportation has been promised by railroad officials and, as this is the most vital feature affecting the valley, much promise is held for the future. During the spring of 1923 a cooperative marketing association, embracing probably about 8,000 acres of potatoes, was organized. This movement will tend toward better prices and standardization during the five-year contract.

*Operation data, Uncompahgre project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	100,000	100,000	100,000	1 97,410	97,410
Acreage irrigated.....	58,270	60,906	64,180	63,760	64,730
Miles of canal operated.....	413	442	448	482	467
Water diverted (acre-feet).....	423,050	420,176	429,820	446,225	427,706
Water delivered to land (acre-feet).....	367,144	390,770	365,853	415,599	422,398
Per acre of land irrigated (acre-feet).....	6.30	6.42	5.70	6.52	6.52

<sup>1</sup> Decrease due to reclassification.

*Settlement data, Uncompahgre project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	1,514	1,536	1,588	1,639	1,624
Population.....	5,279	5,471	6,015	6,166	6,149
Number of irrigated farms.....	1,514	1,536	1,588	1,639	1,624
Operated by owners or managers.....	949	1,012	1,077	941	944
Operated by tenants.....	565	514	511	698	680
Population.....	5,279	5,471	6,015	6,166	6,149
Number of towns.....	3	3	3	3	3
Population.....	6,960	6,960	7,450	7,450	7,450
Total population in towns and farms.....	12,229	12,421	13,465	13,616	13,599
Number of public schools.....	26	27	27	27	27
Number of churches.....	27	27	27	27	27
Number of banks.....	8	8	8	8	7
Total capital stock.....	\$588,800	\$594,025	\$621,763	\$618,250	\$560,100
Amount of deposits.....	\$4,484,626	\$5,550,465	\$4,925,150	\$3,219,773	\$2,930,700
Number of depositors.....	10,000	11,000	11,000	11,000	11,250

## IDAHO, BOISE PROJECT.

J. B. BOND, project manager, Boise, Idaho.

The Boise project is located in the counties of Ada, Boise, Canyon, and Elmore, Idaho, and Malheur, Oreg. It is served by the Oregon Short Line Railroad and branch lines, also the Idaho Traction and Caldwell Traction Co. electric lines. The length of the irrigation season is 184 days from April 5. The average elevation of the irrigable area is 2,500 feet above sea level. The rainfall at Boise for 58 years averaged 13.64 inches. The greater part of this precipitation occurs outside of the growing season. The average highest recorded temperature for 23 years is 102° F., and the average lowest temperature for the same period is 2° F. The character of the soil is clayey loam, light sandy loam, and sandy loam. The principal products are alfalfa, wheat, oats, clover, potatoes, apples, prunes, and head lettuce. The principal markets are Boise, Nampa, Caldwell, and Meridian, Idaho; Portland, Oreg.; and eastern cities. The limiting area of farm units on public land is 80 acres and on private land 160 acres.

The irrigation plan provides for storage of water in the Arrowrock Reservoir on Boise River, about 22 miles above Boise, and in the Deer Flat Reservoir near Caldwell and Nampa, Idaho; the diversion of water from Boise River by the Boise River Dam, about 8 miles above Boise; the distribution of water on the south side of Boise River, through the Main canal, leading from the dam to the Deer Flat Reservoir; distributing laterals heading in the Main canal; distributing canals heading in the Deer Flat Reservoir; and distributing canal systems heading in the Boise River below the Boise River Dam; and the distribution of water on the north side of the Boise River to a small area of land east of Boise through a canal system heading in the Boise River Dam. Water is diverted from two large drains in the Pioneer Irrigation District and carried through a gravity canal across the Boise River near Caldwell to supply 6,500 acres in the Notus division.

### SUMMARY OF DATA FOR BOISE PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		353,941
Public land entered to June 30, 1923.....	67,468	
Public land withdrawn on June 30, 1923.....	5,660	
State land unsold on June 30, 1923.....	5,980	
Private land, June 30, 1923.....	274,933	
Acreage bureau could supply, season of 1922.....		283,411
Acreage irrigated, season of 1922 (crop census).....		112,000
Acreage cropped, season of 1922 (crop census).....		108,500
Value of irrigated crops, season of 1922.....		\$3,992,600
Value of irrigated crops per acre cropped.....		\$36.80
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of Congressional authorizations.....	\$1,418,163.06	
Disbursements and liabilities.....	1,155,453.81	
Unencumbered balance June 30, 1923.....		\$262,709.24
Fiscal year 1924, amount specified in appropriation act.....		\$1,390,000.00

	Fiscal year, 1923.	To June 30, 1923.
<b>Irrigation works—</b>		
Net construction cost.....	\$305,628.76	\$12,731,409.73
<b>Less water-right contracts—</b>		
Project lands (96,549 acres).....	42,617.35	7,492,859.86
Warren Act lands (approximately 177,618 acres).....	279,228.71	5,155,576.70
<b>Total.....</b>	<b>321,846.06</b>	<b>12,648,436.56</b>
<b>Balance.....</b>	<b>\$16,217.30</b>	<b>82,973.17</b>

<sup>1</sup> Contra.



*Summary of data for Boise project to end of fiscal year 1923.—Continued.*

	Calendar year, 1922.	To Dec. 31, 1922.	Fiscal year, 1923.	To June 30, 1923.
Net operation and maintenance cost .....	\$227,468.45	\$1,407,933.13	\$223,548.24	\$1,530,627.13
Less:				
Charges billed or contracted .....	295,388.23	1,497,369.38	279,583.71	1,499,239.50
Penalties .....	7,257.47	15,200.18	9,680.85	21,276.99
Discounts .....	18,668.58	138,154.16	14,807.28	41,528.01
Total .....	293,987.12	1,474,415.41	284,457.28	1,478,991.48
Balance .....	166,518.67	66,482.28	66,909.04	51,635.65
Net operation and maintenance drainage cost .....	38,218.12	72,113.24	36,973.77	101,280.22
Less:				
Charges billed or contracted .....	179,167.76	272,595.77	141,873.29	342,078.62
Penalties .....	1,442.54	1,602.76	9,067.09	9,875.97
Discounts .....	11,081.35	12,493.78	11,118.00	12,169.14
Total .....	179,528.95	271,704.75	149,822.29	348,785.45
Balance .....	1141,310.88	199,591.51	112,908.52	247,526.23
Investment to date.	Reclamation fund.	Judgment Court of Claims.	Increase of compensa- tion (net).	Total.
Disbursements and net transfers .....	\$15,758,890.89	\$56,228.93	\$176,348.60	\$15,965,438.42
Less collections .....	4,237,131.85			4,237,131.85
Net investment June 30, 1923 .....	11,521,759.04	56,228.93	176,318.60	11,748,306.57

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Other credits to June 30, 1923.	
To return net construction cost:						
Water-right charges.....	\$430,244.95	\$1,737,824.13	\$237,431.48	\$1,374,177.52	\$26,092.00	\$338,554.61
Charges paid in advance.....			1332.52	9,044.56		
To return net regular operation and maintenance cost:						
Project lands (96,540 acres).....	187,678.87	965,906.79	143,663.76	737,401.28	24,592.53	203,912.93
Warren act lands (approximately 177,818 acres).....	91,904.84	533,332.71	78,506.65	469,360.01	16,932.43	47,040.27
Total.....	279,583.71	1,499,239.50	222,170.41	1,206,761.29	41,525.01	250,958.20
Penalties and interest.....			9,680.85	21,276.99		
To return net operation and maintenance cost (drainage):						
Drainage charges, project lands.....	141,873.29	342,078.62	119,224.36	146,336.87	3,169.14	152,572.61
Charges paid in advance.....			117.12	.02		
Penalties and interest.....			9,067.09	9,875.97		
Revenues:						
Rentals of irrigating water.....	18,767.97	740,015.18	16,756.50	722,167.21	4,720.50	13,127.47
Rentals of power and light.....	10,952.20	117,279.80		96,424.61	20,855.19	
Rentals of grazing and farming lands.....	1255.55	20,147.79	1233.62	20,059.09		88.70
Total.....	29,464.62	877,442.77	16,522.88	838,650.91	25,575.69	13,216.17
Miscellaneous uncollected Other miscellaneous collections (reclamation fund).....			22,751.17	591,007.72		3,182.92
Grand total collections.....			686,608.60	4,237,131.85		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 19.5 per cent of total accruals:  
 Uncollected regular operation and maintenance charges as of June 30, 1923, 16.7 per cent of total accruals;  
 Uncollected operation and maintenance (drainage) charges as of June 30, 1923, 44.6 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

On the Main South Side Canal, Arrowrock division, concrete siding amounting to 917 feet was placed to protect a filled section of the canal. At the head of the Robinson Hill pipe line 1,700 feet of wood-stave pipe were replaced with reinforced concrete pipe of 30-inch diameter. The Hubbard-Beal surface drain having a length of 4,900 linear feet, and involving 3,444 cubic yards of excavation, was constructed by contract. The Government drainage organization continued to operate from Wilder. About 5½ miles of deep drains were completed, involving 213,600 cubic yards of class 1 excavation and the placing of 154 cubic yards of concrete and 23,430 feet b. m. of lumber.

During 1922, 527,156 acre-feet of water were delivered to 3,260 farms, containing an irrigated area of 155,000 acres. The average amount of water used was 3.46 acre-feet at an average cost of \$1.58 per acre irrigated, for operation and maintenance. The cost for operation and maintenance per acre irrigable amounted to \$1.46.

Deer Flat Reservoir was filled on April 22. Water went over the spillway of Arrowrock Reservoir on May 24. On July 4 the first stored water was used from Arrowrock Reservoir on project lands.

*Maintenance.*—The removal of silt from canals and laterals cost 12 per cent of the total expenditure for operation and maintenance. Work was done by teams and one Ruth ditch cleaner. About 18,000 cubic yards of sand and gravel were removed from the Main Canal near the diversion dam. This material washed in during high water and had decreased the canal flow. No serious and very few minor breaks occurred during the year. Small structures replaced number 413, and 91 new structures were installed. In general the canal and lateral system is in good condition.

## CROPS AND DEVELOPMENT.

Crop conditions were generally good and yields were excellent, with the exception of grain which was affected adversely by a short period of hot weather. There was a general increase in the number of live stock kept on the farms, and also an increase in the number of range cattle and sheep fed on the project during the winter. Dairy herds continued to grow and improve in grade.

*Operation data, Boise project, Idaho, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage to which bureau was prepared to furnish water.....	<sup>1</sup> 223,866	<sup>1</sup> 274,339	<sup>1</sup> 274,125	<sup>1</sup> 274,379	<sup>1</sup> 282,831	<sup>1</sup> 283,411
Acreage irrigated.....	<sup>2</sup> 95,524	<sup>2</sup> 110,000	<sup>2</sup> 125,000	<sup>2</sup> 131,760	<sup>2</sup> 153,000	<sup>2,3</sup> 155,000
Miles of canal operated.....	982	988	989	1,000	1,016	1,056
Water diverted (acre-feet).....	618,272	824,462	759,084	853,810	844,195	748,570
Water delivered to land per acre of land irrigated (acre-feet).....	3.07	3.75	3.34	3.00	3.67	3.46

<sup>1</sup> Including partial service to vested water-rights land.

<sup>2</sup> Acreage served with full water supply.

<sup>3</sup> 112,000 covered by crop census.

*Settlement data, Boise project.*

Item	1918	1919	1920	1921	1922
Total number of farms on project.....	3,992	3,992	4,000	4,085	<sup>1</sup> 4,998
Population.....	13,200	15,000	16,000	16,340	14,700
Number of irrigated farms.....	3,080	3,207	3,280	3,300	3,559
Operated by owners or managers.....	2,090	2,545	2,417	2,440	2,898
Operated by tenants.....	970	662	863	860	663
Population.....	9,170	10,000	11,176	11,550	14,236
Number of towns.....	10	10	10	8	8
Population.....	36,000	40,000	36,400	36,170	36,170
Total population in towns and on farms...	49,200	55,000	52,400	52,510	50,870
Number of public schools.....	24	24	24	28	28
Number of churches.....	52	54	56	56	56
Number of banks.....	15	15	17	16	16
Total capital stock.....	\$1,800,000	\$2,000,000	\$1,850,000	\$2,741,000	\$2,741,000
Amount of deposits.....	\$11,500,000	\$13,500,000	\$20,600,000	\$16,326,000	\$16,707,000
Number of depositors.....	<sup>2</sup> 25,000	<sup>2</sup> 28,000	<sup>2</sup> 32,000	<sup>2</sup> 30,000	<sup>2</sup> 30,000

<sup>1</sup> All vested water-right lands excluded with the exception of 21,500 acres of the New York Canal Co.<sup>2</sup> Estimated: Some banks refuse to give number of depositors.

## IDAHO, KING HILL PROJECT.

A. M. RAWN, project manager, King Hill, Idaho.

The King Hill project is located in the counties of Elmore, Gooding, Twin Falls, and Owyhee and in townships 5 and 6 south, ranges 8 to 13 east, Boise meridian. The estimated population of the four project towns is as follows: Glens Ferry, 1,597; Bliss, 180; King Hill, 200; Hammett, 75. The main line of the Oregon Short Line runs the entire length of the project. The water supply is obtained from the Malad River, which is fed by numerous large springs. The annual run-off is approximately 1,000,000 acre feet. The water for the project is diverted from the Malad River at a point about a mile above its confluence with the Snake River, 300 second-feet of water being delivered to the canal system of the project by the Idaho Power Co. by means of a timber flume 4,000 feet long. The main canal is 50 miles long and crosses the Snake River twice by means of wood-stave pipe siphons on steel bridges. About half of the irrigable area lies on each side of the Snake River. There are 16,249 acres supplied by gravity and 574 acres supplied by pumps. The average elevation above sea level is 2,750 feet. During the past 10 years the average annual rainfall was 9.2 inches, the average maximum temperature was 107°, and the average minimum temperature was 4° F. The soil on the project ranges from light to heavy sandy loam with some heavy clay. With an irrigation season of 193 days the project produces principally alfalfa, early vegetables, grain, and stock. These find a ready market at Portland, Boise, and small towns in southern Idaho. The project was reconstructed under contract with the King Hill Irrigation District. Work was begun in February, 1918, and on June 30, 1923, all work contemplated under the contract was completed.

### SUMMARY OF DATA FOR KING HILL PROJECT TO END OF FISCAL YEAR 1923.

**Areas and crops:**

Irrigable acreage when project is complete.....	16,823
Public land entered to June 30, 1923.....	516
Public land open to entry on June 30, 1923.....	71
Public land withdrawn on June 30, 1923.....	6
State land unsold on June 30, 1923.....	400
Other private land June 30, 1923.....	15,830

Acreage bureau could supply, season of 1922.....	13,648
Acreage irrigated, season of 1922.....	6,440
Acreage cropped under irrigation, season of 1922.....	6,050
Value of irrigated crops, season of 1922.....	\$219,900
Value of irrigated crops per acre cropped.....	\$36.20

**Finances:**

<b>Appropriations—</b>	
Fiscal year 1921, amount of congressional authorizations.....	\$516,769.53
Disbursements and liabilities.....	391,411.42
Unencumbered balance June 30, 1923.....	\$125,358.11
Fiscal year 1924, amount specified in appropriation act.....	\$ 5,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$409,766.99	\$1,881,391.45
Water-right contracts, project lands (16,823 acres).....		2,000,000.00
<b>Balance.....</b>	<b>409,766.99</b>	<b>118,608.55</b>

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Cash collected.		Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	
To return net construction cost, water-right charges.....	\$50,644.77	\$127,416.97			\$127,416.97
Revenues, rentals of irrigating water.....	28,726.24	52,230.73	\$35,978.80	\$49,366.37	2,861.36
Miscellaneous uncollected.....					1,999.40
Other miscellaneous collections.....			9,758.91	54,128.89	
Grand total collections.....			35,737.71	103,495.26	

Investment to date.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$1,887,836.74	\$100,698.15	\$1,988,534.89
Less collections.....	103,495.26		103,495.26
Net investment June 30, 1923.....	1,784,341.48	100,698.15	1,885,039.63

- Uncollected construction water-right charges as of June 30, 1923, 100 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1923 (water rentals), 5.5 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

Construction consisted of a general repair, betterment, and replacement of canals and structures over the entire project. The results, in the main, are as follows: The entire main canal, 50 miles in length, excepting structures built by the Bureau of Reclamation and 26 miles of laterals, were reconstructed and enlarged. Fourteen miles of new laterals were built. Earthwork involved a total excavation of 62,000 cubic yards of earth and 4,100 cubic yards of rock. Six wood-stave siphons with an average diameter of 50 inches and having a total length of 19,588 feet, were repaired, rebuilt in part, and enlarged by adding additional staves. Concrete inlet and outlet structures of efficient and modern design were built for these wood-stave siphons. Various stretches of the main canal and important laterals were lined with reinforced concrete, a total of 28,000 cubic yards of lining having been placed. Two pumping plants with an average capacity of 10 second-feet were rebuilt. Drops in the canal were utilized to run the pumps which are turbine driven. Six semicircular steel flumes, with diameters of 2 to 7 feet, were built, the combined length of which is 2,345 feet. A total of 18,986 feet of lock joint concrete pipe was manufactured and installed. Heads vary up to 139 feet in the pipes. The following minor structures were built: Ten concrete chutes, total length 4,586 feet; 2 rubble masonry chutes, total length 2,800 feet; 5 concrete drops; 12 masonry drops; 176 timber turnouts; 25 timber checks; 31 timber drops; 142 timber weirs; and 4,835 feet of machine banded 12 to 26 inch wood-stave pipe siphons.

*Seepage and evaporation.*—At the time the Government took over the reconstruction of the project there had been constructed one open drain about 0.3 mile long to take care of surface water in Pasadena Valley. This drain had been enlarged and extended to a total length of 0.8 mile to provide an outlet for surface water from about 600 acres.

*Operation and maintenance.*—The irrigation system was operated by the forces of the Bureau of Reclamation under contract with the King Hill Irrigation District dated January 11, 1922. From July 1 to September 15, 1922, water delivery was maintained with only minor interruptions resulting from small breaks in the main canal and laterals. On September 15 water was turned out of the system to permit winter construction operations and cleaning. Water service was resumed on the main canal extension on March 20, 1923, and in the entire system on April 5, 1923.

*Operation data, King Hill project, by calendar years.*

Item.	1920	1921	1922
Acres for which bureau was prepared to supply water .....	11,340	13,648	13,648
Acres irrigated .....	4,780	5,900	6,440
Miles of canal operated .....	83.2	83.2	91.3
Water diverted (acre-feet) .....	43,660	56,153	61,326
Water delivered to land (acre-feet) .....	22,420	30,028	35,875
Per acre of land irrigated (acre-feet) .....	4.69	5.08	5.57

*Settlement data, King Hill project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project .....	225	225	225	225	260	260
Population .....	350	350	350	424	557	599
Total irrigated farms .....	125	125	125	125	160	175
Operated by owners or managers .....	110	110	110	110	141	131
Operated by tenants .....	15	15	15	15	19	44
Number of towns .....	3	3	3	4	4	4
Population .....	1,350	1,425	1,500	1,572	1,685	2,062
Total population of towns and farms .....	1,700	1,775	1,850	1,996	2,242	2,651
Number of public schools .....	4	4	4	5	6	6
Number of churches .....	4	4	5	5	5	5
Number of banks .....	1	1	1	2	2	1
Total capital stock .....	\$20,000	\$20,000	\$20,000	\$30,000	\$30,000	\$20,000
Amount of deposits .....	\$183,436	\$245,545	\$418,548	\$319,036	\$275,000	\$275,000
Number of depositors .....		758	738	1,060	824	800

# IDAHO, MINIDOKA PROJECT.

BARRY DIBBLE, Project Manager, Burley, Idaho.

The Minidoka project is located in Minidoka and Cassia Counties, Idaho; Jackson Lake Reservoir is in Lincoln County, Wyo. The Oregon Short Line is the only railroad on the project. Project towns and estimated population are: Burley, 5,000; Rupert, 2,500; Paul, 350; Declo, 150; Heyburn, 135; Acequia, 35. The source of water supply is Snake River, supplemented by storage. The irrigation season is from April 1 to October 15 (198 days); average rainfall for the past 18 years 12 inches; average of maximum and minimum temperatures for the past 18 years 99.2° and -13.6°. The principal products are alfalfa, wheat, oats, clover seed, sugar beets, and potatoes.

The project is watered by two canal systems, one on either side of Snake River. Power developed at the diversion dam is used in pumping water from the canals for irrigating high lands, and is also used for municipal and domestic purposes. Storage for the project is provided by a reservoir at Jackson Lake, Wyo., with a total capacity of 847,000 acre-feet, and by Lake Walcott, at the upper end of the project, with an available capacity of 100,000 acre-feet.

## SUMMARY OF DATA FOR MINIDOKA PROJECT TO END OF FISCAL YEAR 1923.

### Areas and crops:

Irrigable acreage when project is complete.....		236,562
Public land entered to June 30, 1923.....	96,258	
Public land open to entry on June 30, 1923.....	449	
Public land withdrawn on June 30, 1923.....	106,840	
State land unsold on June 30, 1923.....	8,467	
Private land, June 30, 1923.....	24,548	
Acreage bureau could supply, season of 1922.....		121,562
Acreage irrigated, season of 1922.....		105,580
Acreage cropped under irrigation, 1922.....		99,805
Value of irrigated crops, season of 1922.....		\$3,019,350
Value of irrigated crops, per acre cropped.....		\$30.25

### Finances:

#### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$1,767,092.76
Disbursements and liabilities.....	1,488,044.34

Unencumbered balance June 30, 1923.....	\$279,048.42
Fiscal year 1924, amount specified in appropriation act.....	665,000.00

		Fiscal year 1923.	To June 30 1923.
<b>Irrigation works:</b>			
Net construction cost.....		\$1,220,737.25	\$8,086,977.12
Less—			
Funds advanced and unapplied credits.....		1 4,260.00	828,267.96
Water-right contracts:			
Project lands, 120,949 acres.....		1 36,925.87	5,609,661.53
Warren Act lands approximately 626,840 acres.....			429,412.50
Other lands.....		236,250.00	243,750.00
Total.....		195,064.13	7,111,081.99
Balance.....		1,025,673.12	955,895.13
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	Calendar year 1922.	To December 31, 1922.	
Net operation and maintenance cost.....	\$112,132.99	\$1,318,703.33	118,991.91
Less—			
Charges billed or contracted.....	126,462.58	1,364,607.32	134,710.72
Penalties.....	8,855.04	18,737.57	5,386.10
Discounts.....	1 1,413.60	1 16,580.56	1 1,067.62
Total.....	133,904.02	1,366,764.33	139,029.20
Balance.....	1 21,771.03	1 48,061.00	1 20,037.29
			1 34,285.79

1 Contra.

## Summary of data for Minidoka project to end of fiscal year 1922—Continued.

Investment.	Reclamation fund.	Judgments Court of Claims.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$9,779,317.74	\$15,550.90	\$105,822.49	\$9,900,691.13
Less collections.....	5,124,961.81			5,124,961.81
Net investment June 30, 1923.....	4,654,355.93	15,550.90	105,822.49	4,775,729.32

## Status of current accounts receivable as of June 30, 1923.

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced and unapplied credits....	<sup>1</sup> \$4,260.00	\$828,267.96	<sup>1</sup> \$4,260.00	\$828,267.96		
Water-right charges...	395,640.67	2,133,694.62	273,017.73	1,671,608.15	\$154,289.87	\$307,796.60
Total.....	391,380.67	2,961,962.58	268,757.73	2,499,876.11	154,289.87	307,796.60
Charges paid in advance.....			210,162.51	212,042.26		
To return net operation and maintenance cost:						
Operation and main- tenance charges—						
Project lands (120,- 949 acres).....	121,166.22	1,252,915.87	91,606.41	1,008,146.80	67,958.01	176,811.06
Warren Act lands (approximately 636,340 acres)....	23,422.31	106,626.41	23,417.66	106,444.50		181.91
Total.....	144,588.53	1,359,542.28	115,024.07	1,114,591.30	67,958.01	176,992.97
Charges paid in advance.....			11,016.32	11,024.14		
Penalties and interest.....			5,335.78	22,238.69	50.32	
Revenues:						
Rentals of irrigating water.....	2,916.32	270,803.36	2,648.72	267,301.53	3,234.23	267.60
Rentals of power and light.....	111,246.46	691,771.30	111,805.70	663,772.58	4,812.08	23,186.64
Rentals of grazing and farming lands.....	<sup>1</sup> 322.82	33,622.87	662.24	29,367.51		4,255.36
Total.....	113,839.96	996,197.53	115,116.66	960,441.62	8,046.31	27,709.60
Miscellaneous uncollected Other miscellaneous collec- tions (reclamation fund).....			58,817.80	304,747.69		402.96
Grand total collec- tions.....			784,230.87	5,124,961.81		

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1923, 10.39 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 13.02 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

*American Falls reservoir.*—By a vote of 7,360 to 1,249 on January 16, the American Falls Reservoir District embracing 394,500 acres was formed to secure 300,000 acre-feet of storage in the American Falls Reservoir. Lands in three projects above American Falls and two below are included in this district. On May 12 the contract between the United States and this district and a bond issue of \$2,700,000 were authorized. This contract together with a similar



one with the Empire Irrigation District for 110,000 acre-feet was executed on June 15. The total storage subscriptions, including 520,000 acre-feet for the proposed Minidoka North Side pumping division, now amount to 995,000 acre-feet for 620,000 acres of land.

On June 15 a contract was entered into with the Idaho Power Company by which a portion of their rights was obtained for the benefit of the reservoir and the proposed Minidoka North Side pumping division.

Contracts were entered into during the last two weeks in June for real estate to the value of \$578,000 for right of way purposes.

Plans were made for the improvement of the new town site of American Falls.

*Commercial power.*—The contract with the Melcher Mining & Milling Co. for furnishing electric power was completed. The power line extending from Albion, Idaho, to the company's mines, about 9 miles in length, was removed and most of the substation equipment at the mine was transferred to the Black Canyon Dam on the Boise project. A contract for the delivery of part of the power generated by the Boise River powerhouse on the Boise project over the line of the Idaho Power Co. to Milner, Idaho, was renewed on April 1, 1923.

Financial conditions on the project showed a marked improvement during the year. Crop yields for 1922 were excellent and, except for potatoes, prices were good. The outlook for 1923 was excellent. The feeling generally among the farmers was one of optimism for the future.

*Operation data, Minidoka project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	120,852	121,000	121,392	121,557	121,557	121,562
Acreage irrigated.....	99,020	105,062	104,259	107,650	107,290	105,590
Miles of canal operated.....	633.19	634.37	634.80	634.60	634.60	634.60
Water diverted (acre-feet).....	616,228	745,821	626,645	734,428	705,929	712,975
Water delivered to land (acre-feet).....	305,278	390,903	349,012	333,766	<sup>1</sup> 99,363	<sup>1</sup> 107,573
Per acre of land irrigated (acre-feet) <sup>1</sup> .....	3.1	3.7	3.3	3.6	<sup>2</sup> 2.13	<sup>2</sup> 2.38

<sup>1</sup> Partially estimated.

<sup>2</sup> South Side pumping division; data from Gravity division not available.

*Settlement data, Minidoka project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	2,327	2,340	2,353	2,420	2,454	2,451
Population.....	7,467	8,490	9,029	9,177	8,848	8,301
Number of irrigated farms.....	2,195	2,208	2,353	2,420	2,454	2,451
Operated by owners or managers.....	1,725	1,556	1,877	1,863	1,987	1,868
Operated by tenants.....	470	652	476	557	467	583
Population.....	7,467	8,490	9,029	9,250	8,848	8,301
Number of towns.....	6	6	6	6	6	6
Population.....	5,300	6,600	8,500	9,000	8,445	8,170
Total population towns and farms.....	12,767	15,090	17,529	18,250	17,293	16,471
Number of public schools.....	20	21	28	26	22	22
Number of churches.....	25	25	25	29	30	29
Number of banks.....	6	8	8	10	16	15
Total capital stock.....	\$165,000	\$240,000	\$260,000	\$345,000	<sup>1</sup> \$190,000	<sup>1</sup> \$180,000
Amount of deposits.....	\$2,522,764	\$2,543,343	\$3,725,691	\$3,860,744	<sup>1</sup> \$1,140,000	<sup>1</sup> \$1,100,000
Number of depositors.....	7,350	10,663	11,086	12,725	<sup>1</sup> 5,900	<sup>1</sup> 5,000

<sup>1</sup> Exclusive of banks that failed.

# MONTANA, HUNTLEY PROJECT.

A. R. McGINNESS, project manager, Ballantine, Mont.

The Huntley project is located in the south central part of Montana, Yellowstone County, and is tributary to the Northern Pacific and the Chicago, Burlington & Quincy Railroads. There are five principal towns on the project—Huntley, Worden, Ballantine, Pompeys Pillar, and Nibbe—which provide excellent commercial facilities to all parts thereof. The entire project is practically completed, and water may be delivered to all lands from the present system. The irrigation plan provides for the diversion of water from the Yellowstone River at a point 2 miles west of Huntley and for a gravity supply to all project lands except 5,400 acres under the high-line canal and its extensions, which are served by two pumping plants located 1½ miles east of Ballantine. These pumping plants elevate a maximum of 106 second-feet up a 45-foot lift into the high-line canal. The water supply for the project is ample and is derived direct from the Yellowstone River without diversion dam or storage works.

The soils consist of heavy clays and light sandy loams, lying at an average elevation of about 3,000 feet above sea level. Climatic conditions are favorable to the production of staple crops. The average annual rainfall is 12 to 13 inches.

## SUMMARY OF DATA FOR HUNTLEY PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		32,473
Public land entered to June 30, 1923.....	26,176	
Public land withdrawn on June 30, 1923.....	2,570	
Private land, June 30, 1923.....	3,727	
Acreage bureau could supply, season of 1922.....		32,000
Acreage irrigated, season of 1922.....		19,523
Acreage cropped under irrigation, season of 1922.....		19,523
Value of irrigated crops, season of 1922.....	\$572,700.00	
Value of irrigated crops per acre cropped.....		\$29.33
<b>Finances:</b>		
Appropriations—Fiscal year 1923, amount of congressional authorizations.....	\$180,904.41	
Disbursements and liabilities.....	41,765.40	
Unencumbered balance June 30, 1923.....		\$139,139.01
Fiscal year 1924, amount specified in appropriation act.....		115,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works—</b>		
Net construction cost.....	\$7,938.32	\$1,475,623.45
<b>Less—</b>		
Funds advanced and unapplied credits.....		717.64
Water-right contracts, project lands (28,033 acres).....	1 3,664.19	1,320,616.25
<b>Total.....</b>	1 3,664.19	1,321,333.89
<b>Balance.....</b>	11,602.51	154,289.56

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
<b>Net operation and maintenance cost.....</b>	\$39,730.89	\$829,707.53	\$39,003.14	\$349,287.82
<b>Less:</b>				
Charges billed or contracted.....	45,426.71	424,298.59	45,902.54	424,162.62
Penalties.....	1,327.97	5,116.54	2,716.81	6,815.26
Discounts.....	1 1,082.89	1 6,590.35	1 644.19	1 6,903.52
<b>Total.....</b>	45,671.79	422,824.78	47,975.18	424,074.86
<b>Balance.....</b>	1 5,940.90	406,882.75	1 8,972.04	425,213.46

Investment.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$2,391,146.30	\$29,733.74	\$2,420,880.04
Less collections.....	762,871.23		762,871.23
<b>Net investment June 30, 1923.....</b>	1,628,275.07	29,733.74	1,658,008.81

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year. 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost: Funds advanced and un- applied credits.....		\$717. 64		\$717. 64		
Water-right charges.....	\$25,526. 60	391,927. 39	14,537. 91	359,127. 72	\$502. 21	\$32,297. 46
Total.....	25,526. 60	392,645. 03	\$14,537. 91	359,845. 36	\$502. 21	32,297. 46
Charges paid in advance.....			1 778. 52	708. 66		
To return net operation and maintenance cost: Operation and maintenance charges, project lands (28033 acres).....	45,902. 54	424,162. 62	31,960. 04	313,915. 45	7,517. 39	102,729. 78
Charges paid in advance.....			418. 87	461. 71		
Penalties and interest.....			2,663. 35	6,678. 76	136. 50	
Revenues: Rentals of irrigating water.....	1,181. 09	6,340. 36	1,061. 35	6,132. 44		207. 92
Rentals of grazing and farming lands.....	832. 78	12,195. 66	1,261. 53	11,659. 99		535. 67
Total.....	2,013. 87	18,536. 02	2,322. 88	17,792. 43		743. 59
Miscellaneous uncollected.....						212. 32
Other miscellaneous collections (Reclamation fund).....			3,976. 12	63,468. 86		
Grand total collections.....			55,100. 65	762,871. 23		

1 Contra.

Uncollected construction water-right charges as of June 30, 1923, 8.22 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 24.2 per cent of total accruals.

**CROPS AND DEVELOPMENT.**

Agricultural crops and general conditions were better on June 30, 1923, than they have been for a number of years. A larger area was in crop than in 1922, and the outlook for the future was extremely favorable.

The cost of operation and maintenance work was gradually receding from the high mark of 1920 and 1921 and a pre-war charge will be possible by 1924. The canal and lateral systems were in fine condition and nearly all wooden structures had been replaced with concrete. Excavating machines had recently cleaned practically the entire lateral system; thus only a nominal amount of work will be required for the 1924 irrigation season.

The drainage system was operating successfully and was requiring little expense for maintenance work except in replacement of trap boxes. More drainage is needed, as nearly 1,300 acres are still water-logged and nonproductive. A number of waste water ditches were also in bad condition and needed cleaning.

*Operation data, Huntley project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to deliver water.....	32,271	31,360	31,265	32,085	31,964	32,000
Acres irrigated.....	19,122	19,262	19,310	20,020	18,800	19,523
Miles of canal operated.....	229	229	229	229	229	229
Water diverted (acre-feet).....	64,344	47,982	92,638	79,079	79,186	72,245
Water delivered to land (acre-feet).....	21,274	20,182	31,785	24,250	26,814	18,768
Per acre of land irrigated (acre-feet).....	1.11	1.06	1.64	1.21	1.42	0.96

*Settlement data, Huntley project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on the project.....	691	691	691	691	691	690
Number of irrigated farms.....	553	561	549	603	578	590
Operated by owners or managers.....	368	359	315	320	377	387
Operated by tenants.....	185	202	234	283	201	203
Population.....	1,880	2,107	2,000	1,883	1,861	1,682
Number of towns.....	8	8	8	8	8	8
Population.....	610	599	599	664	673	673
Total population in towns and on farms.....	2,490	2,706	2,599	2,547	2,534	2,355
Number of public schools.....	8	8	8	8	8	8
Number of churches.....	6	6	6	6	7	7
Number of banks.....	4	4	4	4	4	2
Total capital stock.....	\$85,000	\$85,000	\$85,000	\$95,000	\$95,000	\$50,000
Amount of deposits.....	\$498,000	\$540,434	\$560,000	\$588,362	\$402,232	\$186,000
Number of depositors.....	1,375	1,400	1,400	1,711	1,475	810

## MONTANA, MILK RIVER PROJECT.

GEORGE E. STRATTON, project manager, Malta, Mont.

R. M. SNELL, project manager, St. Mary storage, Browning, Mont.

The Milk River project is located on the Great Northern Railway in northeastern Montana, about 50 miles south of the Canadian boundary, and extending from the mouth of the Milk River (which is about 120 miles west of the North Dakota line) westward for about 150 miles to and beyond Chinook. The average elevation is about 2,200 feet; the soil grades from loam through finer textured loam or clay to a soil known locally as gumbo. The average annual rainfall is about 13.24 inches; the ordinary maximum summer and minimum winter temperatures are about 100° and -40° F., respectively.

The irrigation plan provides for the storage of water in the Sherburne Lakes and its diversion through a canal 28.9 miles long, heading three-fourths of a mile below the lower St. Mary Lake and discharging into the North Fork of Milk River, thence flowing through Canada for 216 miles and returning to the United States for the irrigation of lands on the Milk River from above Chinook to and below Glasgow; the storage of water in Nelson reservoir located about 20 miles northeast of Malta; a storage reservoir known as the Chain Lakes Reservoir, between Havre and the Canadian boundary; the diversion of water from the Milk River by three dams near Chinook and Harlem into canals on each side of the river comprising the Chinook division; the diversion of water from the Milk River by a dam near Dodson into two canals, the Dodson North Canal irrigating lands near Dodson and Malta, and the Dodson South Canal conveying water to Nelson Reservoir and irrigating lands near Wagner, Malta, Bowdoin, Saco, and Hinesdale, comprising the Malta division; and the diversion of water from the Milk River by a dam near Vandalia into a canal on the south side of the river for the irrigation of lands near Tampico, Glasgow, and Nashua, comprising the Glasgow division.

### SUMMARY OF DATA FOR MILK RIVER PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		154, 101
Public land entered to June 30, 1923.....	31, 056	
Public land withdrawn on June 30, 1923.....	16, 632	
State land unsold on June 30, 1923.....	6, 194	
Other private land, June 30, 1923.....	100, 219	
Acreage bureau could supply, season of 1922.....		1 98, 500
Acreage irrigated, season of 1922.....		2 46, 370
Acreage cropped under irrigation, season of 1922.....		3 43, 150
Acreage dry-farmed, season of 1922.....		4 14, 250
Value of irrigated crops, season of 1922.....		5 \$590, 500
Value of irrigated crops per acre cropped.....		6 \$13. 70
Value of dry-farmed crops, season of 1922.....		7 \$138, 641
Value of dry-farmed crops per acre cropped.....		8 \$9. 75
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$671, 556. 34	
Disbursements and liabilities.....	191, 410. 81	
Unencumbered balance June 30, 1923.....		480, 145. 53
Fiscal year 1924, amount specified in appropriation act.....		140, 000. 00
<b>Irrigation works, net construction cost:</b>		
Fiscal year 1923.....	202, 186. 94	
to June 30, 1923.....		6, 762, 063. 25

Investment to date.	Reclamation fund.	Judgments Court of Claims.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$7, 128, 246. 41	\$2, 674. 64	\$90, 910. 97	\$7, 221, 832. 02
Less collections.....	347, 345. 03			347, 345. 03
Net investment June 30, 1923.....	6, 780, 901. 38	2, 674. 64	90, 910. 97	6, 874, 486. 99

1 Includes 30,000 acres on Chinook division.

2 Includes 28,200 acres on Chinook division.

3 Includes 25,000 acres on Chinook division.

4 Exclusive of Chinook division.

5 Includes \$398,400 on Chinook division.

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.		Other credits to June 30, 1923.	Uncollected June 30, 1923.
	Fiscal year, 1923.	To June 30, 1923.	Cash.			
			Fiscal year, 1923.	To June 30, 1923.		
Charges paid in advance.....				\$1,114.00		
Revenues:						
Rentals of irrigating water.....	\$19,637.09	\$176,106.28	\$18,608.63	152,148.26	\$487.21	\$23,470.81
Rentals of grazing and farming lands.....	3,965.56	27,139.71	4,249.16	26,732.49	20.88	386.34
Total.....	23,602.65	203,245.99	22,857.79	178,880.75	508.09	23,857.15
Miscellaneous uncollected.....						1,169.14
Other miscellaneous collections (Reclamation fund).....			12,715.01	167,350.28		
Grand total collections..			35,572.80	347,345.03		

### ACTIVITIES DURING THE FISCAL YEAR.

Enlargement of Nelson Reservoir to 66,800 acre-feet capacity was completed; extension of lateral systems in the vicinity of Hinsdale and Glasgow was continued; a small mileage of operation and maintenance roads was built; and a small amount of drainage work was done.

*St. Mary Canal.*—Thirty-eight hundred linear feet of canal bank were rebuilt to prevent excessive leakage.

*Operation and maintenance.*—Thirty miles of laterals, waste water ditches, and smaller canals were cleaned with the Ruth dredger at a cost of about \$152 per mile. Six thousand acre-feet of water were delivered to 214 users on the Malta and Glasgow divisions, and 33,300 acre-feet, including 7,055 acre-feet of St. Mary supplemental water, were diverted by the various canal companies on the Chinook division.

Twenty-eight thousand five hundred and eighty acre-feet of water were stored in Sherburne Lakes Reservoir between June 20 and July 18. Approximately one-half of the water stored was diverted to Milk River, the rest being wasted.

The St. Mary Canal was operated from May 20 to September 30. Eighty-one thousand one hundred acre-feet of water were diverted from St. Mary River and 66,090 acre-feet delivered to the North Fork of Milk River.

A settlement campaign was commenced by the Great Northern Railway.

*Operation data, Milk River project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	45,000	58,750	58,900	68,600	<sup>1</sup> 94,100	<sup>2</sup> 96,500
Acreage irrigated.....	11,058	24,842	25,485	24,330	<sup>3</sup> 42,400	<sup>4</sup> 46,370
Miles of canal operated.....	<sup>5</sup> 204	<sup>6</sup> 254	<sup>7</sup> 317	<sup>8</sup> 361	<sup>9</sup> 247	<sup>10</sup> 255
Water diverted.....	<sup>11</sup> 68,503	<sup>12</sup> 74,924	<sup>13</sup> 86,690	<sup>14</sup> 80,786	<sup>15</sup> 54,444	<sup>16</sup> 102,832
Water delivered to the land (acre-feet).....	<sup>17</sup> 11,195	<sup>18</sup> 16,900	<sup>19</sup> 21,500	<sup>20</sup> 10,460	<sup>21</sup> 6,190	<sup>22</sup> 6,068
Per acre of land irrigated (acre-feet).....	<sup>23</sup> 1.01	<sup>24</sup> 0.68	<sup>25</sup> 0.84	<sup>26</sup> 0.58	<sup>27</sup> 0.54	<sup>28</sup> 0.51

<sup>1</sup> Includes 27,727 acres on Chinook division. Reduction on Malta and Glasgow divisions due to better data on irrigable areas.

<sup>2</sup> Includes 30,000 acres on Chinook division.

<sup>3</sup> Includes 26,000 acres on Chinook division.

<sup>4</sup> Includes 23,200 acres on Chinook division.

<sup>5</sup> Does not include Chinook division.

<sup>6</sup> Includes water for Nelson reservoir.

<sup>7</sup> Includes water for Nelson reservoir, but does not include 33,335 acre-feet diverted for Chinook division.

<sup>8</sup> Includes water for storage in Nelson reservoir and 27,655 acre-feet diverted on the Chinook division.

*Settlement data of irrigated district, Milk River project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project <sup>1</sup> .....	217	249	466	364	296
Population.....	<sup>2</sup> 688	<sup>3</sup> 757	<sup>4</sup> 867	<sup>5</sup> 816	<sup>6</sup> 1,057
Number of irrigated farms.....	184	247	230	178	209
Operated by owners or managers.....	140	186	208	134	130
Operated by tenants.....	44	61	22	44	79
Population.....	600	750	763	484	651
Number of towns.....	9	11	<sup>7</sup> 15	<sup>8</sup> 15	<sup>9</sup> 15
Population.....	6,000	6,500	<sup>10</sup> 7,796	<sup>11</sup> 7,170	<sup>12</sup> 7,100
Total population on farms and towns.....	6,688	7,257	<sup>13</sup> 8,063	<sup>14</sup> 7,986	<sup>15</sup> 8,157
Number of public schools.....	18	20	<sup>16</sup> 38	<sup>17</sup> 38	<sup>18</sup> 38
Number of churches.....	18	22	<sup>19</sup> 25	<sup>20</sup> 25	<sup>21</sup> 25
Number of banks.....	15	<sup>22</sup> 23	<sup>23</sup> 25	<sup>24</sup> 24	<sup>25</sup> 23
Total capital stock.....	\$525,000	<sup>26</sup> \$780,000	<sup>27</sup> \$765,000	<sup>28</sup> \$825,000	<sup>29</sup> \$843,000
Amount of deposits <sup>3</sup> .....	<sup>30</sup> \$3,219,000	<sup>31</sup> \$5,279,730	<sup>32</sup> \$4,500,000	<sup>33</sup> \$3,562,000	<sup>34</sup> \$4,350,000
Number of depositors <sup>3</sup> .....	<sup>35</sup> 11,640	<sup>36</sup> 17,600	<sup>37</sup> 14,000	<sup>38</sup> 12,500	<sup>39</sup> 12,000

<sup>1</sup> Total number farms reported on crop census.

<sup>2</sup> Includes Chinook division.

<sup>3</sup> Deposits received from large area not in project.

# MONTANA, SUN RIVER PROJECT.

GEO. O. SANFORD, project manager, Great Falls, Mont.

The Sun River project is located in Cascade, Chouteau, Lewis and Clark, and Teton Counties, lying to the north and west of Great Falls, Mont. It is served by lines of the Great Northern and the Chicago, Milwaukee & St. Paul Railways. The sources of water supply are Sun River and its tributaries, Deep Creek, Bowl Creek, and Basin Creek. The average elevation of the irrigable area is about 3,700 feet above sea level; the soil is loam, clay, and alluvium. The average annual rainfall is 10.8 inches; the average annual temperatures are: Maximum, 96° F.; minimum, -33° F.; mean, 44° F. The length of the irrigation season is from May 1 to October 10, 163 days. The principal crops are hay, grain, vegetables, live stock, and dairy products; the principal markets are Great Falls, St. Paul, Minneapolis, and Chicago.

The Fort Shaw division is watered by a canal system taking water from the Sun River. For the irrigation of lands north of Sun River, water is diverted from the North Fork of Sun River and is carried through Pishkun, Sun River Slope, and Greenfields Canals to the head of the irrigable lands in Greenfields division. The distribution system has been built for the irrigation of 25,000 acres in part 1 of Greenfields division, and for 2,300 acres in Big Coulee division. That for about 12,000 acres in part 2 of Greenfields division is under construction.

Plans for future development provide for storage works on the upper North Fork of Sun River, enlargement of Pishkun, Sun River Slope, and Greenfields Canals, and construction and extension of lateral systems under the canals. Possible future development may include the diversion of Bowl and Basin Creeks across the Continental Divide into Sun River drainage, the enlargement of Willow Creek Reservoir, and diversion of water from North Fork of Sun River thereto, the enlargement of Pishkun Reservoir and diversion of water from Deep Creek thereto, storage works on Muddy Creek and in Benton Lake, and canal systems for the Vaughn and Benton divisions.

## SUMMARY OF DATA FOR SUN RIVER PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		158,851
Public land entered to June 30, 1923.....	42,348	
Public land withdrawn on June 30, 1923.....	38,026	
State land unsold on June 30, 1923.....	9,181	
Other private land, June 30, 1923.....	69,296	
Acreage bureau could supply, season of 1922.....	42,465	
Acreage irrigated, season of 1922.....	20,537	
Acreage cropped under irrigation, season of 1922.....	19,881	
Acreage dry-farmed, season of 1922.....	3,507	
Value of irrigated crops, season of 1922.....	\$390,690	
Value of irrigated crops per acre cropped.....	\$16.35	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations.....	\$368,740.81	
Disbursements and liabilities.....	340,791.92	
Unencumbered balance June 30, 1923.....	\$27,948.89	
Fiscal year 1924, amount specified in appropriation act.....	145,000.00	

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$210,522.06	\$4,248,361.84
Less water-right contracts, project lands 12,917.85 acres.....	14,570.80	423,127.04
<b>Balance.....</b>	<b>215,092.86</b>	<b>3,825,234.80</b>

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
<b>Net operation and maintenance cost.....</b>				
	\$14,569.42	\$192,237.02	\$13,404.24	\$199,251.24
<b>Less:</b>				
Charges billed or contracted.....	13,819.19	163,302.05	13,432.44	162,915.30
Penalties.....	478.88	1,753.69	579.77	2,036.58
Discounts.....	1,206.64	12,737.46	1,170.71	12,849.78
<b>Total.....</b>	<b>13,991.43</b>	<b>162,318.28</b>	<b>13,841.50</b>	<b>162,102.10</b>
<b>Balance.....</b>	<b>577.99</b>	<b>29,918.74</b>	<b>1,437.26</b>	<b>37,149.14</b>

<sup>1</sup> Contra.



*Summary of data for Sun River project to end of fiscal year 1923—Continued.*

Investment	Reclamation fund.	Judgments Court of Claims.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$4,584,631.21	\$1,585.35	\$63,796.14	\$4,650,012.70
Less collections.....	433,636.00			433,636.00
Net investment June 30, 1923.....	4,150,995.21	1,585.35	63,796.14	4,216,376.70

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges.....	\$11,563.86	\$160,357.20	\$5,036.87	\$140,900.36	\$96.67	\$19,360.17
Charges paid in advance.....			236.71	29,181.70		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (10,133.22 acres).....	13,432.44	162,915.30	7,935.10	122,618.61	2,870.50	37,426.19
Charges paid in advance.....				10.55		
Penalties and interest.....			579.74	2,036.55	.03	
Revenues:						
Rentals of irrigating water.....	13,357.02	48,244.88	8,456.00	21,121.30	230.09	26,892.89
Rentals of grazing and farming lands.....	3,216.26	31,332.81	3,370.14	26,725.14		4,607.67
Total.....	16,573.28	79,577.69	11,826.14	47,846.44	230.09	31,500.56
Water rental charges paid in advance.....			73.36	73.36		
Miscellaneous uncollected.....						1,606.81
Other miscellaneous collections (Reclamation fund).....			6,003.13	90,968.43		
Grand total collections.....			31,217.63	433,636.00		

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1923, 12.1 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 23 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

*Greenfields division.*—Proposals for the construction of laterals and structures for the irrigation of about 12,000 acres of land in part 2, Greenfields division, were opened June 6, 1922, and contracts awarded to the low bidders. All earthwork was completed early in the spring of 1923. The structural contractor was making slow progress and will not finish the work until the latter part of the present season. A contract for the construction of a reinforced concrete highway bridge, two spans, each 21 feet long, was awarded October 21, 1922, and the work completed June 15, 1923.

Seepage on the Greenfields division has been increasing since 1920 and plans were approved to begin the construction of drainage works in 1922. A drag-line excavator was transferred from the Riverton project and work started on open drain A, August 31. This drain was finished early in the spring and work started on

open drain C, which was completed by June 30. A total of 5.1 miles of drains was excavated during the fiscal year. A second drag line was transferred from Riverton in May, 1923, and work started on the electrification of the two drag lines and the construction of transmission lines to carry electrical energy from the substation of the Montana Power Co., about 9 miles west of Fairfield, to the seeped areas where additional drains are to be excavated. At the end of the fiscal year the transmission lines were completed and the first electric drag line was ready to begin excavating. Work was started on changing the second drag line from gas to electrically operated.

Considerable trouble was experienced in maintaining Greenfields canal in the vicinity of mile 3, where it follows along the sloping hillside of Big Coulee. Plans were approved for making a water-tight canal for a distance of 1,700 feet by placing a tar and rag-felt diaphragm on top of the first concrete lining and then a second layer of reinforced concrete 3 inches in thickness. This work was started early in May and completed June 22, 1923.

*Fort Shaw division.*—The canal system was successfully operated for the irrigation of 8,115 acres of land.

The season of 1923 started under favorable conditions. The rainfall in May was below the average and there were a few hot days in June, but during the last half of the month heavy rains were of frequent occurrence and the total precipitation was 5.22 inches, the greatest of record for June. As a result all crops were in excellent condition.

*Operation data, Sun River project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acres for which bureau was prepared to supply water.....	16,224	14,978	40,067	40,057	40,087	42,465
Acres irrigated.....	6,675	7,569	11,496	14,780	21,750	20,537
Miles of canal operated.....	100	96	244	250	267	267
Water diverted (acre-feet).....	25,481	30,087	42,863	75,595	88,258	64,683
Water delivered to land (acre-feet).....	9,091	11,193	24,080	21,653	30,300	24,200
Per acre of land irrigated (acre-feet)...	1.36	1.48	1.9	1.47	1.39	1.17

*Settlement data, Fort Shaw and Greenfields divisions, Sun River project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	254	239	212	500	500	500
Population.....	476	508	542	1,000	1,000	1,000
Number of irrigable farms.....	176	187	201	354	387	393
Operated by owners of managers.....	120	118	151	264	290	275
Operated by tenants.....	56	69	50	90	97	118
Population.....	476	508	542	861	949	978
Number of towns.....	8	8	8	8	4	4
Population.....	168	158	155	685	378	401
Total population in towns and on farms...	644	666	697	1,685	1,378	1,401
Number of public schools.....	4	4	4	17	17	17
Number of churches.....	4	4	4	11	11	11
Number of banks.....	1	1	1	15	13	3
Total capital stock.....	\$20,000	\$20,000	\$20,000	\$110,000	\$65,000	\$71,500
Amount of deposits.....	\$95,000	\$98,000	\$110,000	\$391,121	\$150,000	\$158,000
Number of depositors.....	310	390	400	1,278	780	740

<sup>1</sup> Applies to whole project rather than to the two divisions named.

# MONTANA-NORTH DAKOTA, LOWER YELLOWSTONE PROJECT.

H. A. PARKER, project manager, Savage, Mont.

The Lower Yellowstone project is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. The source of water supply is the Yellowstone River, diversion from which into the main canal is at a point 18 miles below Glendive. Irrigation works have been constructed to deliver water to about 58,000 acres. Water is available for practically the entire irrigable area. The length of the irrigation season depends upon the amount of precipitation in the spring. May 1 to October 10, 163 days, is the maximum period of water deliveries. The average elevation is 1,900 feet above sea level. The average number of days between the last killing frost in the spring and the first in the fall is 129. Since 1905 the average annual rainfall has been about 14.4 inches. The average of the highest temperature is 103° F., and the average of the lowest is 35° F. Some alkali and gumbo are found in scattering low tracts, but the project as a whole has a deep sandy loam soil. As the irrigable area of the project is a long and narrow tract with cross drainage creeks at intervals of 3 to 6 miles, seepage has not been serious. The duty of water is about 1.5 acre-feet per acre. The principal crops are alfalfa, grain, sugar beets, potatoes, and corn. Billings, Mont., is the market for sugar beets; Duluth and Minneapolis, Minn., for grain; Chicago and the South for potatoes. Forage crops are consumed locally.

## SUMMARY OF DATA FOR LOWER YELLOWSTONE PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....	59,529	
Public land entered to June 30, 1923.....	13,636	
Public land withdrawn on June 30, 1923.....	2,412	
State land unsold on June 30, 1923.....	986	
Railroad land unsold on June 30, 1923.....	95	
Other private land, June 30, 1923.....	42,400	
Acreage bureau could supply, season of 1922.....	40,200	
Acreage irrigated, season of 1922.....	15,599	
Acreage cropped under irrigation, season of 1922.....	15,400	
Acreage dry farmed, season of 1922.....	13,470	
Value of irrigated crops, season of 1922.....	\$334,100	
Value of irrigated crops per acre cropped.....	\$21.68	
Value of dry-farmed crops, season of 1922.....	\$157,940	
Value of dry-farmed crops per acre cropped.....	\$11.83	
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$187,997.77	
Disbursements and liabilities.....	82,753.26	
Unencumbered balance June 30, 1923.....	\$106,244.51	
Fiscal year 1924, amount specified in appropriation act.....	120,000.00	

	Fiscal year, 1923.	To June 30, 1923.
<b>Finances:</b>		
Irrigation works—		
Net construction cost.....	\$66,543.62	\$3,632,949.27
Less water-right contracts: Project lands (58,248.11 acres); other lands (approximate 1,281 acres).....		3,614,104.21
Balance.....	66,543.62	18,845.06

	Calendar year, 1922.	To Dec. 31, 1922.	Fiscal year, 1923.	To June 30, 1923.
<b>Finances:</b>				
Irrigation works—				
Net operation and maintenance cost <sup>1</sup> .....	\$87,782.78	\$204,172.49	\$41,115.78	\$221,920.56
Less—				
Charged bills or contracted <sup>2</sup> .....	\$89,348.60	204,174.53	37,153.52	199,417.21
Penalties.....		2.59		2.59
Discounts (contra).....		\$4.63		\$4.63
Total.....	\$89,348.60	204,172.49	37,153.52	199,415.17
Balance.....	1,565.82		3,962.26	22,505.39

<sup>1</sup> Actual cost for the year.....	\$31,531.55
Less adjustment.....	119,314.33

Net.....	\$87,782.78
<sup>2</sup> Contra.....	

<sup>3</sup> Actual charges billed during year.....	\$41,910.84
Less adjustment.....	131,259.44

Net.....	\$89,348.60
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## Summary of data for Lower Yellowstone project to end of fiscal year 1923—Contd.

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensation (net).	Total.
<b>Finances:</b>				
Investment—				
Disbursements and net transfers.....	\$3,999,663.73	\$12,835.88	\$27,719.01	\$4,040,218.62
Less collections.....	299,525.49			299,525.49
Net investment June 30, 1923.....	3,700,138.24	12,835.88	27,719.01	3,740,693.13

## Status of current accounts receivable as of June 30, 1923.

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges .....		\$41,135.10		\$41,135.10		
Charges paid in advance .....				197.60		
To return net operation and maintenance cost:						
Operation and miscellaneous charges, project lands (37,195.87 acres) .....	\$49,932.24	194,102.80	\$17,024.45	62,359.28	\$4.63	\$131,738.89
Charges paid in advance .....			101.00			
Penalties and interest .....				2.59		
Revenues:						
Rentals of irrigating water .....	1,242.60	123,265.68	2,400.93	121,899.18		1,396.50
Rentals of grazing and farming lands .....	273.25	2,974.62	195.25	2,863.62		111.00
Total .....	1,515.85	126,240.30	2,596.18	124,732.80		1,507.50
Miscellaneous uncollected .....						70.80
Other miscellaneous collections (reclamation fund) .....			953.15	71,098.12		
Grand total collections ..			20,472.78	299,525.49		

<sup>1</sup> Contra.

Uncollected operation and maintenance charges as of June 30, 1923, 68 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

Construction work consisted of the completion of the Thomas Point pumping plant and the continuation of lateral extensions, both earth-work and structures. Several worn-out wooden structures were replaced with concrete. The construction work required to deliver water to all project land was practically complete with the exception of a few minor lateral extensions and additional turnouts, which are put in as required. About 330 structures were built and 54,000 cubic yards of earth excavated during the year.

The silt problem is serious, particularly on the first 10 miles of main canal. About 250,000 cubic yards of silt had accumulated in this distance and a start was made toward its removal. It is the intention to completely clean this during the calendar years 1923 and 1924. Draglines will be employed, and one new machine was purchased recently for this purpose. One Ruth ditch cleaner was operated continuously during the summer months on laterals and

had the system in fairly good condition. About 83,400 cubic yards have been removed to date at a unit price of \$0.08 per cubic yard. Worn-out wooden structures were being replaced, mainly with concrete, as required.

*Operation data, Lower Yellowstone project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	42,288	42,232	42,167	<sup>1</sup> 40,200	<sup>1</sup> 40,344	<sup>1</sup> 40,200
Acreage irrigated.....	15,744	21,075	21,300	19,120	19,980	15,599
Miles of canal operated.....	180	186	188	187	174	213
Water diverted (acre-feet).....	60,205	51,445	70,029	47,375	64,972	49,280
Water delivered to land (acre-feet).....	27,842	23,321	26,252	16,633	25,733	18,411
Per acre of land irrigated (acre-feet).....	1.77	1.11	1.23	0.87	1.28	1.17

<sup>1</sup> District lands only.

*Settlement data, Lower Yellowstone project.*

Item.	<sup>1</sup> 1918	<sup>1</sup> 1919	<sup>2</sup> 1920	<sup>2</sup> 1921	<sup>2</sup> 1922
Total number of irrigable farms.....	514	514	543	572	575
Population.....	1,120	1,284	1,368	1,390	1,591
Number of irrigated farms.....	370	405	375	370	370
Irrigable farms operated by owners.....	200	204	226	178	200
Irrigable farms operated by tenants.....	75	85	94	117	114
Irrigable farms having neither owner nor tenant living thereon.....	165	166	172	277	261
Number of towns.....	8	8	8	8	8
Population.....	3,500	3,900	2,850	2,805	2,805
Total population in towns and on farms....	4,620	5,184	<sup>3</sup> 4,218	4,195	4,396
Number of public schools.....	19	<sup>4</sup> 12	<sup>4</sup> 12	<sup>4</sup> 12	13
Number of churches.....	8	13	15	15	15
Number of banks.....	10	10	10	<sup>5</sup> 9	<sup>5</sup> 7
Total capital stock.....	\$330,000	\$330,000	\$330,000	\$335,000	\$200,000
Amount of deposits.....	\$2,000,000	\$2,365,000	\$2,331,000	\$1,851,000	\$1,425,000
Number of depositors.....	7,000	7,500	6,500	4,726	4,475

<sup>1</sup> Project on rental basis.

<sup>2</sup> Project operated under contracts with irrigation districts.

<sup>3</sup> Part of decrease due to exact census.

<sup>4</sup> Decrease in number of schools due to consolidation.

<sup>5</sup> Decrease in number of banks due to consolidation and one failure.

# NEBRASKA-WYOMING, NORTH PLATTE PROJECT.

ANDREW WEISS, project manager, Mitchell, Nebr.

The North Platte project is situated in western Nebraska and eastern Wyoming. The source of water supply is the North Platte River. The irrigation plan provides for storage of flood waters of the river in Pathfinder Reservoir, located about 50 miles southwest of Casper, Wyo., and in smaller reservoirs along the canal lines, and diversion from the North Platte River by a dam near Whalen, Wyo., into the Interstate Canal, supplying water for lands on the north side of the river, and into the Fort Laramie Canal watering lands on the south side. A dam to be constructed near Guernsey, Wyo., will provide additional storage, form a regulating reservoir, and develop power. The Northport division, on the north side in the vicinity of Northport, Nebr., is watered from an extension of the Tri-State Canal.

Three irrigation districts have been formed. The Northport Irrigation District includes all of the Northport division; the Gering and Fort Laramie Irrigation District covers all of the Fort Laramie division in Nebraska; and the Goshen Irrigation District, organized during the fiscal year, covers all of the Fort Laramie division in Wyoming. The limit of area of farm units on all divisions is 80 acres for public and 160 acres for private land.

The railroads serving the project cities and towns, which have an estimated population of 29,900, are the Chicago, Burlington & Quincy and Union Pacific. The character of the soil varies from sandy loam on the major portion of the Interstate and Northport divisions to gumbo soil on portions of the Fort Laramie division. The principal products are alfalfa, cereals, corn, sugar beets, and potatoes, and the principal markets are Omaha, Nebr., Kansas City and St. Joseph, Mo., Denver, Colo., and central Wyoming. The length of the irrigating season is from April 1 to September 30 and the average rainfall amounts to 14.29 inches. The average temperature ranges between 98° maximum and -24° F. minimum.

## SUMMARY OF DATA FOR NORTH PLATTE PROJECT TO END OF FISCAL YEAR 1923.

	Interstate.	Fort Laramie.	Northport.	Total.
<b>Areas and crops:</b>				
Irrigable acreage when project is complete..	114,933	107,000	15,000	236,933
Public land entered to June 30, 1923.....	83,697	44,689	6,500	134,886
Public land withdrawn on June 30, 1923.....	1,443	15,511	500	17,454
State land unsold on June 30, 1923.....	529	7,325	1,400	9,254
Other private land, June 30, 1923.....	29,264	39,475	6,600	75,339
Acreage bureau could supply, season of 1922.....	113,436	44,091	4,712	162,239
Acreage irrigated, season of 1922.....	87,300	20,302	3,645	111,247
Acreage cropped under irrigation, season of 1922.....	87,300	20,090	3,445	110,835
Value of irrigated crops, season of 1922.....	\$1,878,450.00	\$312,050.00	\$72,500.00	\$2,263,000.00
Value of irrigated crops per acre cropped....	\$21.52	\$15.55	\$21.05	\$20.42

### Finances:

#### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$1,726,162.31
Disbursements and liabilities.....	1,705,754.57

Unencumbered balance June 30, 1923.....	\$20,407.74
Fiscal year 1924, amount specified in appropriation act.....	1,420,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$1,040,244.33	\$14,011,574.27
<b>Less:—</b>		
Funds advanced and unapplied credits.....	36,096.58	37,676.49
Water-right contracts—		
Project lands (108,803.07 acres).....	34,426.67	7,862,989.63
Warren Act lands (approximately 125,873 acres).....	53,969.62	1,073,633.60
<b>Total.....</b>	<b>124,492.87</b>	<b>8,974,299.52</b>
<b>Balance.....</b>	<b>924,751.46</b>	<b>5,037,274.75</b>

*Summary of data for North Platte project to end of fiscal year 1923—Continued.*

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost .....	\$178,791.53	\$1,609,453.54	\$167,587.99	\$1,693,539.13
Less:				
Charges billed or contracted .....	195,455.52	1,766,234.98	203,423.00	1,792,629.38
Penalties .....	7,849.27	24,351.68	6,014.72	25,212.38
Discounts .....	<sup>1</sup> 3,916.05	<sup>1</sup> 31,299.72	<sup>1</sup> 1,649.60	<sup>1</sup> 31,628.30
Total .....	199,388.74	1,759,286.94	207,788.12	1,786,213.46
Balance .....	<sup>1</sup> 20,597.16	<sup>1</sup> 149,533.40	<sup>1</sup> 40,200.13	<sup>1</sup> 92,674.33

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensa- tion (net).	Total.
Investment:				
Disbursements and net transfers .....	\$16,143,949.25	\$26,425.67	\$321,428.92	\$16,491,803.84
Less collections .....	3,682,415.94			3,682,415.94
Net investment June 30, 1923 .....	12,461,533.31	26,425.67	321,428.92	12,809,387.90

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.		Uncol- lected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash. Fiscal year 1923.	Other credits to June 30, 1923.	
To return net construction cost:					
Funds advanced and unapplied credits .....	\$34,882.73	\$36,462.64	\$31,213.85	\$32,793.76	\$3,668.88
Water-right charges .....	395,881.76	2,375,985.27	142,419.02	1,675,079.77	666,610.58
Total .....	430,764.49	2,412,447.91	173,632.87	1,707,873.53	670,279.46
Charges paid in advance .....			<sup>1</sup> 513.78	599.13	
To return net operation and maintenance cost:					
Operation and maintenance charges—					
Project lands (approximately 105,000 acres) .....	176,967.20	1,585,091.03	69,667.25	1,135,801.81	408,056.42
Warren Act lands (approximately 125,873 acres) .....	26,455.80	207,538.35	29,617.20	177,220.86	30,261.31
Total .....	203,423.00	1,792,629.38	99,284.45	1,313,022.67	438,317.73
Charges paid in advance .....			<sup>1</sup> 207.73	0.00	
Penalties and interest .....			5,721.18	24,789.80	422.58
Revenues:					
Rental of irrigation water .....	8,883.99	168,841.72	9,791.12	168,255.61	584.11
Rentals of power and light .....	28,936.02	83,609.48	26,517.79	68,072.64	3,143.54
Rentals of grazing and farming lands .....	9,914.39	80,676.92	8,637.46	74,434.86	6,242.06
Total .....	47,734.40	333,128.12	44,946.37	310,763.11	9,969.71
Miscellaneous uncollected. Other miscellaneous collections (reclamation fund) .....					4,561.18
			37,479.55	325,367.70	
Grand total collections .....			360,342.91	3,682,415.94	

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 27.7 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1923, 24.4 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

*Storage.*—The land within the site for the Guernsey Reservoir was purchased at a total cost of approximately \$100,000 and a road 2 miles in length was constructed to the dam site.

The inflow at the Pathfinder Reservoir was below normal and the carry-over at the end of the irrigation season was only 244,840 acre-feet. During the winter months necessary repairs to the linings of the South Tunnel outlets were effected.

*Interstate Division.*—Work was continued on the enlargement and strengthening of the Interstate Canal and the replacement of structures in the third lateral district under supplemental construction. On the completion of the Northport division, the Bucyrus class 14 drag line was moved from that division to the work on the Interstate Canal. One Monighan drag line worked the entire year.

Seven miles of canal were enlarged, 354,500 cubic yards of material being moved. One hundred and forty-two wooden structures in the third lateral district were replaced with concrete.

The Spottedtail outlet channel was completed. A concrete highway bridge was constructed over the Winters Creek outlet channel. Several old drainage channels were enlarged and extended requiring the use of two to three drag lines during the available working period.

As a result of a hot and dry season the demand for water was greater than in previous years and the amount of water delivered per acre irrigated was larger than for any previous year. On account of the limited capacity of the Interstate Canal it was necessary to deliver water on a rotation basis from June 13 to July 27 and from August 20 to 31. Three Ruth ditch-cleaning machines were operated with very satisfactory results; 130 miles of laterals were cleaned at a unit cost of 15 cents per cubic yard, field cost.

*Fort Laramie Division.*—Two electric drag lines continued work on the excavation of the Fort Laramie Canal, excavating 1,080,000 cubic yards of material and completing 17 miles of canal. The Horse Creek siphon on the canal was completed by Government forces and work begun on the Kiowa Creek siphon and the Brown's Canyon crossing. The structures on 20 miles of the canal were contracted. The Horse Creek lateral system, covering 1,868 acres of land in Wyoming and 12,623 acres in Nebraska, was completed in time for delivery of water at the beginning of the 1923 season. The earthwork on the lateral system under the Fort Laramie Canal between Horse Creek and Tunnel No. 3, covering 25,000 acres, was contracted and work was begun by Government forces and contractors on the construction of the concrete structures. A contract was let to R. S. Morrow & Son, of Omaha, Nebr., for the construction of Tunnel No. 3 on the Fort Laramie Canal. The tunnel will be 6,500 feet long, the inside measurement being 10 feet 3 inches. Construction work began during June, 1923.

One class 9½ electric drag line was operated continuously throughout the year, completing the Katzer drain in Wyoming and beginning work on the Kiowa drainage system in Nebraska. During the year 21.38 miles of open drain were completed, the total excavation being 430,000 cubic yards. A P. & H. drag line excavated several short drainage ditches. Work was begun on the construction of the Gering drain under a cooperative contract with the Gering Irrigation Dis-



tract. During the year 3.3 miles of drain were completed, requiring the excavation of 107,000 cubic yards of material and the construction of several structures, the principal of which was a concrete chute of 1,600 second-feet capacity.

The Fort Laramie Canal was operated to Horse Creek at Mile 67.5, water being delivered to the land under the Springer lateral system for the first time. Deliveries were made on demand on a water-rental basis to all land desiring the same. The system although new was operated with few breaks. The canal was operated continuously for the first 25 miles to furnish water for the Lingle power plant, with some difficulty at low heads owing to the settling of silt in the upper reaches of the canal, requiring a drag line for removal.

*Northport division.*—The construction of the Northport division was completed in the spring of 1923 and the construction forces and equipment moved to the Fort Laramie division. The Bucyrus class 14 drag line was transferred to the Interstate division and the electric drag line to the Shoshone project. Water could be delivered to all of the land on the division at the beginning of the irrigation season of 1923.

The Indian Creek drain and its branches on the Northport division was completed; 188,000 cubic yards of material were excavated from the 3.4 miles of drainage ditches.

Water was delivered through the Northport Canal for the first season, being available for 4,712 acres of land. Water was delivered on demand under the contract between the United States and the Northport Irrigation District.

*Operation data, Interstate division, North Platte project, by calendar years.*

Item.	1917	1918	1919	1920	1921	<sup>1</sup> 1922.
Acres for which bureau was prepared to supply water.....	\$ 129,891	\$ 129,778	\$ 129,715	\$ 129,629	\$ 129,666	113,436
Acres irrigated.....	\$ 92,553	\$ 97,908	\$ 99,418	\$ 97,640	\$ 97,400	87,800
Miles of canal operated.....	805	805	805	807	809	805
Water delivered to land (acre-feet).....	\$ 177,472	\$ 204,819	\$ 201,605	\$ 175,153	\$ 186,328	222,509
Per acre of land irrigated (acre-feet).....	\$ 2.13	\$ 2.31	\$ 2.27	\$ 1.99	\$ 2.14	2.55

<sup>1</sup> All data exclusive of North Platte Canal & Colonization Co. lands.

<sup>2</sup> Includes North Platte Canal & Colonization Co. lands.

<sup>3</sup> Exclusive of lands under North Platte Canal & Colonization Co. tract.

*Operation data, Fort Laramie division, North Platte project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acres for which bureau was prepared to supply water.....	12,132	12,182	16,232	16,232	44,091
Acres irrigated.....	4,865	6,258	8,530	12,150	20,302
Miles of canal operated.....	70	79	130	138	311
Water delivered to the land (acre-feet).....	5,087	18,060	16,755	22,665	43,689
Per acre of land irrigated (acre-feet).....	1.04	2.89	1.97	1.85	2.15

*Operation data, Northport division, North Platte project.*

Item.	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	1,600	2,220	4,712
Acreage irrigated.....	1,220	2,260	3,645
Water delivered to the land (acre-feet).....	1,526	3,864	11,722
Per acre of land irrigated (acre-feet).....	1.27	1.75	3.02

*Settlement data, Interstate division, North Platte project.*

Item.	1918	1919	1920	1921	<sup>1</sup> 1922
Total number of farms on project.....	1,406	1,420	1,410	1,450	1,458
Population.....	4,500	4,500	5,000	5,700	5,300
Number of irrigated farms.....	1,274	1,310	1,800	1,340	1,340
Operated by owners or managers.....	774	800	800	710	720
Operated by tenants.....	500	450	500	630	620
Population.....	4,200	4,066	4,746	5,200	4,782
Number of towns.....	8	8	9	9	9
Population.....	11,000	11,610	14,382	14,400	14,400
Total population in towns and on farms.....	16,500	16,110	19,882	20,100	19,900
Number of public schools.....	40	40	40	40	40
Number of churches.....	25	25	26	26	26
Number of banks.....	16	21	21	27	12
Total capital stock.....	\$352,000	\$462,000	\$777,500	\$787,500	\$475,000
Amount of deposits.....	\$2,800,000	\$3,100,000	\$7,371,100	\$6,834,400	\$3,957,700
Number of depositors.....	7,200	7,500	12,000	11,200	650

<sup>1</sup> Statistics for previous years include some figures for Fort Laramie and Northport divisions.

*Settlement data, Fort Laramie division, North Platte project.*

Item.	1921	1922
Total number of farms on project.....	407	573
Population.....	1,500	1,086
Number of irrigated farms.....	190	320
Operated by owners or managers.....	105	244
Operated by tenants.....	85	76
Population.....	433	650
Number of towns.....	3	11
Population.....	2,900	5,000
Total population in towns and on farms.....	4,400	6,086
Number of public schools.....	10	20
Number of churches.....	1	16
Number of banks.....	18	12
Total capital stock.....	<sup>2</sup> \$185,000	\$285,000
Amount of deposits.....	<sup>2</sup> \$1,039,600	\$1,794,900
Number of depositors.....	5,500	360

<sup>1</sup> Lands on the Interstate and Fort Laramie divisions are tributary to 6 of the banks listed above.

<sup>2</sup> \$155,000 of this amount is listed under similar caption on Interstate division.

<sup>3</sup> \$919,600 of this amount is listed under similar caption on Interstate division.

*Settlement data, Northport division, North Platte project.*

Item.	1922	Item.	1922
Total number of farms on project.....	232	Total population in towns and on farms.....	2,220
Population.....	800	Number of public schools.....	7
Number of irrigated farms.....	50	Number of churches.....	5
Operated by owners or managers.....	19	Number of banks.....	2
Operated by tenants.....	31	Total capital stock.....	\$50,000
Population.....	250	Amount of deposits.....	\$327,000
Number of towns.....	2	Number of depositors.....	150
Population.....	1,400		

# NEVADA, NEWLANDS PROJECT.

JOHN F. RICHARDSON, project manager, Fallon, Nev.

The Newlands project is located on the Southern Pacific Railroad, in Churchill, Storey, Lyon, and Washoe Counties, Nev. The water supply is from the Truckee and Carson Rivers. The average annual precipitation on the irrigable area, which is at an elevation of about 4,000 feet above sea level, is 4.94 inches. The principal crops are alfalfa, grain, potatoes, melons, and dairy products. Farm units range in size from 40 to 160 acres.

## SUMMARY OF DATA FOR NEWLANDS PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....	150,000	
Public land entered to June 30, 1923.....	32,525	
Public land open to entry on June 30, 1923.....	4,112	
Public land withdrawn on June 30, 1923.....	25,486	
Indian land, June 30, 1923.....	23,877	
Railroad land unsold on June 30, 1923.....	20,000	
Other private land, June 30, 1923.....	53,000	
Acreage bureau could supply, season of 1922.....	73,747	
Acreage irrigated, season of 1922.....	44,963	
Acreage cropped under irrigation, season of 1922.....	42,393	
Value of irrigated crops, season of 1922.....	\$1,849,719	
Value of irrigated crops per acre cropped.....	\$43.63	
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$367,380.82	
Disbursements and liabilities.....	565,462.56	
Unencumbered balance, June 30, 1923.....	\$301,918.26	
Fiscal year 1924, amount specified in appropriation act.....	735,000.00	

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$299,084.33	\$6,990,498.85
Less water-right contracts, project lands (48,778 acres).....	1 54,335.00	2,638,279.01
Balance.....	353,419.33	4,352,219.84

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$111,847.35	\$968,472.89	\$118,496.21	\$1,044,213.12
<b>Less:</b>				
Charges billed or contracted.....	216,319.89	903,945.52	117,626.63	900,499.26
Penalties.....	2,453.82	8,425.63	3,991.28	11,288.97
Discounts.....	1 2,480.84	1 13,369.28	1 2,487.61	1 15,786.77
Total.....	216,292.87	899,001.87	119,130.30	896,001.46
Balance.....	1 104,445.52	69,471.02	1 634.09	148,211.66

	Reclamation fund.	Judgments Court of Claims.	Increase of compensation (net).	Total.
<b>Investment:</b>				
Disbursements and net transfers.....	\$8,463,570.43		\$80,083.31	\$8,543,653.74
Less collections.....	1,609,105.20			1,609,105.20
Net investment June 30, 1923.....	6,854,465.23		80,083.31	6,934,548.54

1 Contra.

NOTE.—Operation and maintenance charges billed or contracted for calendar year 1923 and to Dec. 31, 1923, and to June 30, 1923, include item of \$95,500, representing amount of operation and maintenance deficit covered by contract dated May 25, 1922, with Truckee-Carson Irrigation district.

*Status of current accounts receivable as of June 30, 1923.*

	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	Uncollect- ed June 30, 1923.
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges.....	\$38,799.68	\$545,370.06	\$32,121.25	\$514,775.66	\$6,004.95	\$24,589.44
Charges paid in advance.....			443.63	1,319.90		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (68,923 acres).....	117,626.63	804,999.26	97,741.12	688,981.95	23,878.12	92,139.19
Charges paid in advance.....			522.91	627.87		
Penalties and interest.....			3,675.89	10,937.07	351.90	
<b>Revenues:</b>						
Rentals of irrigating water.....	1,282.95	16,936.22	1,348.20	16,916.72		19.50
Rentals of power and light.....	23,226.19	184,360.56	23,328.63	157,512.41	25,487.75	1,360.40
Rentals of grazing and farming land.....	532.33	24,584.62	124.73	24,138.62		446.00
<b>Total.....</b>	<b>25,041.47</b>	<b>225,881.40</b>	<b>24,801.56</b>	<b>198,567.75</b>	<b>25,487.75</b>	<b>1,825.90</b>
Miscellaneous and uncollected. Other miscellaneous collections (reclamation fund).....			9,970.13	193,895.00		1,435.81
<b>Grand total collections..</b>			<b>169,276.49</b>	<b>1,609,105.20</b>		

Uncollected construction water-right charges as of June 30, 1923, 0.223 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 0.087 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

The distribution system was extended by the construction under small contracts of about 4.8 miles of laterals, involving about 32,177 cubic yards of earthwork.

In accordance with the contract executed March 3, 1923, with the Canyon Power Co., the work of installing a new 78-inch steel penstock from the reservoir to the Lahontan power plant was commenced during March, and considerable preliminary work, including the excavation of a tunnel under the left spillway of Lahontan Dam, was completed at the end of the fiscal year. Under this contract the power company transferred to the United States all of their filings and water rights on the Truckee River, thereby removing an obstacle in the way of the construction of the Spanish Springs Reservoir.

During April the location of the feeder canal for Spanish Springs Reservoir was commenced. This work was completed during June. Negotiations for securing right of way for this reservoir were in progress at the end of the year.

**Drainage.**—Construction of deep open drains under the contract dated January 22, 1921, with the Truckee-Carson irrigation district was continued. On June 30, 1923, drains aggregating 110 miles had been completed under this contract and 10.3 miles of other drains, charged to operation and maintenance, were excavated. Plans for additional drainage were being made at the end of the year to be constructed upon the completion of the present contract.

**Operation and maintenance.**—Portions of Truckee Canal tunnels Nos. 1 and 3, in which the concrete lining had shown signs of failure, were timbered as a temporary expedient pending permanent repairs.

For the season of 1923 the delivery of water for irrigation commenced about the 1st of April, although minor deliveries for young alfalfa and grain were made during March.

The Lahontan power plant was in operation during the entire year under lease by the Canyon Power Co. without a shut-down on account of water shortage.

The water supply from both the Truckee and Carson Rivers was ample for the area under irrigation.

Maintenance work was done by Government forces. A Ruth dredger for ditch cleaning was placed in operation on February 28, 1923, and at the end of June had cleaned 29.5 miles of laterals.

A contract dated February 16, 1923, with the city of Fallon was approved March 12, 1923. Under this contract a franchise was granted to the United States for a power line through the city of Fallon and the United States agreed to construct ditches to permit the removal of the Scott ditch from the city limits. This ditch work was completed during May.

*Operation data, Newlands project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	71,817	65,809	69,310	72,166	73,747
Acreage irrigated.....	42,311	44,324	45,610	46,160	44,963
Miles of canal operated.....	356	365	389	393	410
Water diverted (acre-feet).....	266,927	317,424	295,225	314,241	400,508
Water delivered to land (acre-feet).....	126,545	134,015	129,814	132,788	141,972
Per acre of land irrigated (acre-feet).....	2.99	3.02	2.85	2.87	3.15

*Settlement data, Newlands project.*

Item.	1917	1918	1919	1920	1921	1922
Number of farms on project.....	600	610	675	785	870	906
Population.....	2,197	2,268	2,386	2,523	2,652	2,460
Number of irrigated farms.....	600	648	694	742	788	778
Operated by owners or managers.....	525	568	619	677	708	681
Operated by tenants.....	75	80	75	65	80	97
Population.....	2,197	2,268	2,386	2,523	2,652	2,460
Number of towns.....	5	5	5	5	5	5
Population.....	1,860	1,900	2,240	2,830	2,500	2,500
Total population, towns and on farms.....	4,057	4,168	4,626	5,353	5,152	4,960
Number of public schools.....	16	14	11	12	11	11
Number of churches.....	7	7	7	8	8	8
Number of banks.....	2	2	2	2	1	1
Capital stock.....	\$116,000	\$116,000	\$150,000	\$115,900	\$75,000	\$75,000
Amount of deposits.....	\$371,240	\$632,000	\$790,000	\$864,360	\$677,104	\$680,700
Number of depositors.....	775	1,214	1,860	2,500	2,000	1,700

<sup>1</sup> Fallon district schools consolidated in 1919.

## NEW MEXICO, CARLSBAD PROJECT.

L. E. FOSTER, project manager, Carlsbad, N. Mex.

The Carlsbad project is located in Eddy County, N. Mex., on the Santa Fe Railway system. Project cities and towns are Carlsbad, population 3,000, and Otis, Loving, and Malaga, with a combined population of 440. The source of water supply is Pecos River. The length of the irrigation season is 260 days, which includes two weeks in winter. The average elevation of the irrigable area is 3,100 feet. The rainfall averages 14.25 inches. The average of recorded temperatures for a period of 21 years ranges from 112° to -7° F. The soil of the irrigable area is Pecos clay and sandy loam, with high lime content. The principal products are cotton, alfalfa, and miscellaneous grains and fruits. The principal markets are Carlsbad, Kansas City, Chicago, New Orleans, and Galveston. The irrigation plan provides for the storage of water in Lake McMillan and in Avalon Reservoir, both controlled by earth and rock-fill dams. Water is diverted at Avalon Reservoir into a canal system, which extends 25 miles in a southerly direction.

### SUMMARY OF DATA FOR CARLSBAD PROJECT TO END OF FISCAL YEAR 1923.

<b>Area and crops:</b>		
Irrigable acreage when project is complete.....	24,991	
Public land entered to June 30, 1923.....	45	
Private land, June 30, 1923.....	24,946	
Acreage bureau could supply, season of 1922.....	24,991	
Acreage irrigated, season of 1922.....	24,076	
Acreage cropped under irrigation, season of 1922.....	22,430	
Value of irrigated crops, season of 1922.....	\$1,197,980	
Value of irrigated crops per acre cropped.....	\$53.41	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations.....	\$38,675.96	
Disbursements and liabilities.....	42,350.46	
Unencumbered balance June 30, 1923.....	\$46,325.50	
Fiscal year 1924, amount specified in appropriation act.....	80,000.00	

	Fiscal year 1923	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$1,374.86	\$1,395,928.79
<b>Less—</b>		
Funds advanced and unapplied credits.....		7,980.06
Water-right contracts, project lands (25,040 acres).....	14,391.75	1,423,892.75
<b>Total.....</b>	<b>14,391.75</b>	<b>1,431,872.81</b>
<b>Balance.....</b>	<b>\$15,766.61</b>	<b>\$35,944.02</b>

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$55,587.90	\$460,691.20	\$43,386.26	\$481,790.56
<b>Less:</b>				
Charges billed or contracted.....	53,557.10	447,736.24	53,847.88	447,736.24
Penalties.....	2,963.26	9,911.79	5,898.13	14,214.57
Discounts.....	1,558.97	15,917.21	1,043.09	16,129.90
<b>Total.....</b>	<b>54,961.39</b>	<b>451,730.82</b>	<b>58,702.87</b>	<b>455,820.91</b>
<b>Balance.....</b>	<b>626.51</b>	<b>8,960.38</b>	<b>\$15,316.61</b>	<b>23,969.65</b>

<sup>1</sup> Contra.

<sup>1</sup> Actual cost for the year.....	\$55,838.97
Less adjustment.....	251.07
<b>Net.....</b>	<b>55,587.90</b>

*Summary of data for Carlsbad project to end of fiscal year 1923—Continued.*

	Reclamation fund.	Increase of compensation (net).	Total.
<b>Investment:</b>			
Disbursements and net transfers.....	\$1,923,596.70	\$27,153.37	\$1,950,750.07
Less collections.....	889,470.95		889,470.95
Net investment June 30, 1923.....	1,034,125.75	27,153.37	1,061,279.12

*Status of current accounts receivable as of June 30, 1923, Carlsbad project.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced.....		\$7,980.06		\$7,980.06		
Water-right charges.....	\$53,507.46	417,896.27	\$59,957.65	382,467.73		\$35,428.54
Total.....	53,507.46	425,876.33	59,957.65	390,447.79		35,428.54
Charges paid in advance.....			273.33	1,129.55		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (25,040 acres).....	53,847.83	447,736.24	68,098.91	391,390.60	\$6,129.90	50,225.74
Penalties and interest.....			5,898.13	14,214.57		
Revenues:						
Rentals of irrigating water.....	383.25	19,241.69	383.25	19,241.69		
Rentals of grazing and farming lands.....	1,653.89	11,695.93	1,413.79	11,161.49		534.44
Total.....	2,037.14	30,937.62	1,797.04	30,403.18		534.44
Miscellaneous uncollected.....						87.51
Other miscellaneous collections (reclamation fund).....			7,439.51	61,895.26		
Grand total collections....			143,464.57	889,470.95		

Uncollected construction water-right charges as of June 30, 1923, 8.48 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 11.22 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

Water was low in the Pecos River and storage reservoir at the beginning of the fiscal year and storage was entirely exhausted on August 15, 1922. The principal crop, which was cotton, suffered no damage, however, on account of water shortage. The season's yield of alfalfa was somewhat curtailed on account of insufficient water for the late crop. Although the yield of cotton and alfalfa was somewhat lower than the average, the price of each product was relatively high. The gross income for the project was appreciably higher than for the previous season and the farms generally made a satisfactory net return.

McMillan Reservoir did not fill during the winter of 1923 and storage was low at the end of June, but there was no shortage of water. The spring was late and crops were backward during the early development. Crop conditions had reached normal by the end of the fiscal

year and prospects were bright for an unusually good crop year. Considerable encouragement was received in the results of feeding cattle and lambs for market. Good profits were reported in feeding both young beeves and lambs in spite of the high local price of alfalfa and grain.

The financial condition of project water users was greatly improved, not only by reason of a good crop year, but principally because of the liquidation of old mortgages and chattel liens through loans made by the Federal land bank on project lands. The bank had completed loans during the fiscal year totaling \$300,900; loans still pending amounted to \$211,620. Construction and operation and maintenance collections amounting to \$137,990.54 were made during the fiscal year, of which the principal amount was collected during the late winter and spring months of 1923.

*Operation data, Carlsbad project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acres for which bureau was prepared to supply water.....	24,775	24,775	24,991	24,991	24,991	24,991
Acres irrigated.....	16,882	19,400	20,363	22,170	23,810	24,076
Miles of canal operated.....	45	45	45	45	45	45
Water diverted (acre-feet).....	95,196	97,320	114,050	131,673	187,500	116,700
Water delivered to land (acre-feet).....	39,559	47,390	48,933	53,644	59,371	56,687
Per acre of land irrigated (acre-feet).....	2.33	2.43	2.4	2.42	2.49	2.36

*Settlement data, Carlsbad project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	1,627	1,660	1,741	1,770	1,769	1,796
Population.....	992	1,257	1,378	1,575	1,435	1,580
Number of irrigated farms.....	535	458	565	363	426	333
Operated by owners or managers.....	1,190	1,231	1,298	1,189	1,277	1,184
Operated by tenants.....	243	227	267	267	149	149
Population.....	992	1,257	1,378	1,575	1,435	1,580
Number of towns.....	4	4	4	4	4	4
Population.....	3,300	3,375	3,375	3,375	3,375	3,440
Total population in towns and on farms.....	4,292	4,632	4,753	4,950	4,810	5,020
Number of public schools.....	7	7	7	13	13	10
Number of churches.....	8	8	8	11	11	12
Number of banks.....	3	3	3	5	3	3
Total capital stock.....	\$275,000	\$275,000	\$275,000	\$275,000	\$225,000	\$225,000
Amount of deposits.....	\$1,271,266	\$1,238,432	\$1,271,845	\$1,049,924	\$1,176,441	\$1,106,300
Number of depositors.....	1,941	2,234	2,011	2,617	2,350	2,374

<sup>1</sup> Water-right applications; 333 farms irrigated and cropped, 1922.

<sup>2</sup> Many farms were operated by one man.



# NEW MEXICO-TEXAS, RIO GRANDE PROJECT.

L. M. LAWSON, project manager, El Paso, Tex.

The Rio Grande irrigation project is an international and an interstate project, including within its present established boundaries approximately 86,000 acres of land in the Elephant Butte irrigation district of New Mexico and 64,000 acres in the El Paso County water improvement district No. 1, of Texas, and approximately 25,000 acres in the Republic of Mexico. The population of the principal city, El Paso, Tex., and suburbs is 95,000, and the project lands and towns have an additional population of 26,000.

Flood waters of the Rio Grande are stored in the Elephant Butte reservoir. With an average rainfall of 10 inches the use of water for irrigation in addition is approximately 3 acre-feet per acre. The irrigation season normally is from February 1 to October 15. Practically all the lands of the project are in private ownership. All lands within the project limits in the United States are in irrigation districts, and contracts for repayment of construction charges, as well as yearly operation and maintenance cost, have been negotiated and executed between these districts and the United States.

The project is divided into four divisions, namely, the Rincon, Leasburg, Mesilla, and El Paso. Each of these divisions is furnished water supply by diversion from the Rio Grande. The last-named division utilizes an international diversion dam located near El Paso, and this structure, maintained jointly by the irrigators of both countries, also diverts the water into the main canal for the Mexican lands.

Construction of the storage feature is practically completed. On June 30, 1923, it was estimated that the distribution system, consisting of the construction of main diversions and reconstruction and extension of the old community ditches as the lateral system, was 85 per cent complete. The drainage system, when complete, will consist of 350 miles of deep, open drain, involving the excavation of 17,000,000 cubic yards, of which on June 30, 1923, 232.6 miles had been constructed.

Power development at Elephant Butte Dam consists of a small plant required for the operation of the water system and furnishing of lights. At the time of the construction of the dam six power gates and penstocks were incorporated in the structure, and it is estimated that a power plant with an output of 18,000 kilowatts could be constructed at some future date.

## SUMMARY OF DATA FOR RIO GRANDE PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		150,000
Public land entered to June 30, 1923.....	1,500	
Public land open to entry on June 30, 1923.....	100	
Public land withdrawn on June 30, 1923.....	700	
State land unsold on June 30, 1923.....	1,000	
Other private land, June 30, 1923.....	146,700	
Acreage bureau could supply, season of 1922.....		116,000
Acreage irrigated, season of 1922.....		189,589
Acreage cropped under irrigation, season of 1922.....		184,412
Value of irrigated crops, season of 1922.....		\$4,479,670
Value of irrigated crops per acre cropped.....		\$53.06
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations.....	\$1,100,071.28	
Disbursements and liabilities.....	1,006,449.54	
Unencumbered balance June 30, 1923.....		\$93,621.74
Fiscal year 1924, amount specified in appropriation act.....		900,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$830,765.45	\$12,146,114.43
<b>Less—</b>		
Nonreimbursable <sup>1</sup> .....		1,000,000.00
Funds advanced for construction.....	\$ 5,000.00	7,650,000.00
Water-right contracts, project lands, 85,000 acres.....		
Total.....	\$ 5,000.00	8,650,000.00
Balance.....	835,765.45	3,496,114.43

<sup>1</sup> Includes 548 acres in Palomas and 4,821 acres in Fort Hancock outside of project limits irrigated under surplus stored water contracts.

<sup>2</sup> 34 Stat. 1357.

<sup>3</sup> Contra. Amount shown on last year's report as "advanced for construction" was refunded during 1923.

*Summary of data for Rio Grande project to end of fiscal year 1923—Continued.*

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost....	\$213,545.62	\$447,300.04	\$181,557.60	\$548,366.12
Less—				
Charges billed or contracted....	215,940.89	448,673.99	217,861.40	450,585.50
Penalties.....	1,383.18	1,455.52	127.95	1,505.08
Discounts.....	1,709.98	1,486.44		1,486.44
Total.....	215,623.09	445,643.07	217,989.35	447,604.14
Balance.....	1,2,077.47	1,656.97	1,36,431.75	100,761.98
	Reclamation fund.	Rio Grande Dam, appro- priation.	Increase of compensation (net).	Total.
Investment:				
Disbursements and net transfers...	\$13,209,667.73	\$1,000,000.00	\$400,089.89	\$14,609,757.62
Less collections.....	2,117,191.84			2,117,191.84
Net investment June 30, 1923.....	11,092,475.89	1,000,000.00	400,089.89	12,492,565.78

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced and un-						
applied credits.....	\$5,000.00					
Water-right charges.....	76,500.00	\$76,500.00	\$76,491.00	\$76,491.00		\$9.00
Total.....	71,500.00	76,500.00	76,491.00	76,491.00		9.00
To return net operation and maintenance cost:						
Operation and mainte-						
nance charges, project						
lands (150,000 acres)....	170,579.27	383,978.52	170,579.27	379,492.08	\$4,486.44	
Warren Act lands (ap-						
proximately 2,525 acres)	1,893.63	5,099.88	1,893.63	5,099.88		
Total.....	172,472.90	389,078.40	172,472.90	384,591.96	4,486.44	
Charges paid in advance			645.36	645.26		
Penalties and interest.....			127.95	1,505.08		
Revenues:						
Rentals of irrigating						
water.....	19,374.19	1,109,475.44	31,598.69	1,075,447.26		34,028.18
Rentals of power and						
light.....		2,243.33		2,243.33		
Rentals of grazing and						
farming lands.....	288.20	1,800.20	281.20	1,785.20		15.00
Total.....	19,662.39	1,113,518.97	31,879.89	1,079,475.79		34,043.18
Miscellaneous uncollected.						63.76
Other miscellaneous collec-						
tions (reclamation fund)....			20,847.56	574,482.65		
Grand total collections.			302,464.66	2,117,191.84		

<sup>1</sup> Amount shown on last year's report as "advanced for construction" was refunded during 1923.Uncollected construction water-right charges as of June 30, 1923, 0.99 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1923, 10 per cent of total accruals.

## ACTIVITIES DURING THE FISCAL YEAR.

*Construction.*—The value of the storage feature has been doubly demonstrated since the beginning of its service in 1915. Exceptionally high floods have been held back and years of extreme drought, including the season of 1922, have been passed over probably with little realization on the part of the project population of the amount of damages to property and loss of crops aggregating many times the cost of the dam which have been avoided. During the past year construction activities have been about equally divided between the distribution and drainage systems. With the construction of the Tornillo heading during January and February the last project main diversion was completed. The old community ditches have been taken over, reconstructed, and extended to form the main laterals for the distribution system. This construction has been under way since 1917 and has been prosecuted as rapidly as funds and opportunities between irrigation seasons would permit, and is now practically completed, the final step being the reshaping of the sections with Ruth ditching machines. The rapid increase in the cultivated area at the beginning of the 1923 season created a demand for the extension of the water service, and many new laterals were built or old ones extended during the last half of the fiscal year to meet this demand. With the diversions constructed, main canals and main laterals practically finished, the distribution system of the project is considered to be 85 per cent complete, the remaining work consisting principally of the construction of sublaterals to 160-acre deliveries with some improvements yet to be made to the main canals and laterals. During the fiscal year the principal work accomplished on main canals were additions to Leasburg Dam; improvements to the Leasburg, east side, and west side canals in the Mesilla Valley; improvements to the Franklin canal, and construction of the first four miles of the Tornillo canal in the El Paso Valley. Construction work on the lateral system consisted of the installation of structures on the old community ditches in the Rincon Valley. In the Mesilla Valley reconstruction of the old community ditches by Ruth ditching machines was completed. Several new laterals were constructed by drag line excavator or team crews, the first 3 miles of the Three Saints lateral and the remaining portion of the La Union East canal being reconstructed by drag line. Many new or additional structures were installed in old canals and laterals as well as on new ones. In the El Paso Valley, work on the lateral system consisted principally of the extension of the island system and the beginning of construction of the Tornillo system. All of the old community ditches not previously reconstructed were gone over with the Ruth ditching machine followed by installation of structures.

*Drainage.*—Construction of the drainage system has been prosecuted vigorously and continuously since 1917 to head off the ravages of a rapidly rising ground-water table, employing probably the largest group of excavating machines ever assembled for drainage of irrigated lands; 282.6 miles of deep, open drains had been constructed to June 30, 1923, out of a total planned system of approximately 350 miles, 38.1 miles of which were constructed during the past fiscal year, 1 mile in the Rincon Valley, 21 miles in the Mesilla Valley, and 16.1 miles in the El Paso Valley. The system is rapidly nearing completion and the results are most gratifying. In all areas to which

drains have been extended the ground water has been rapidly and effectively lowered. Solubility of alkali salts present (black alkali being almost entirely absent) and the pervious character of the sandy subsoil render leaching of the salt from the land a comparatively easy process, when the land is properly leveled and bordered, and the results which have been accomplished are very encouraging.

*Repayments.*—The first installment of construction charges was assessed by the irrigation districts during the season of 1922, the opening notices served on the districts in 1921 having been postponed one year. Assessments were made on the basis of a construction charge of \$90 per acre and were levied on 50,000 acres in the Elephant Butte irrigation district for land opened in the Mesilla Valley and on 33,000 acres of land in the El Paso County water improvement district No. 1 for land opened in the El Paso Valley and the Texas portion of the Mesilla Valley, the first payment being 2 per cent of the announced construction charge of \$90 per acre. For 1923 an additional area of 12,000 acres has been opened to construction charges in the El Paso County water improvement district.

*Operation and maintenance.*—During the season of 1922 the bureau delivered water to 84,200 acres of land on the project, the irrigation districts making all collections and paying the cost of operation and maintenance in accordance with notices served on them pursuant to their contracts with the Government. The districts placed a minimum charge on all land included within the opened area on which construction charges were assessed. In addition surplus stored water was furnished to 5,369 acres outside the project limits. On account of improved sluicing facilities and the large amount of construction or reconstruction work accomplished during the year, the amount of canal and lateral cleaning was greatly reduced. Favorable prices for cotton and a yield above the average proved the impetus for bringing in much new land, resulting in an appreciable increase in the area irrigated, the irrigation districts having received applications for a total of 92,600 acres within the project limits up to June 30, 1923. In addition surplus stored water was being supplied to approximately 6,000 acres outside the project limits.

*Operation data Rio Grande project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acres for which bureau was prepared to supply water.....	88,000	92,300	107,000	109,000	109,000	116,000
Acres irrigated.....	64,308	64,781	70,000	73,346	85,580	80,589
Miles canal and drain operated.....	86	153	385	546	586	645
Water diverted (acre-feet).....	622,177	613,638	603,711	677,963	782,866	906,728
Water delivered to land (acre-feet).....		348,295	174,946	226,464	197,086	204,452
Per acre of land irrigated (acre-feet).....	8.0	5.37	2.5	2.95	2.55	2.28

<sup>1</sup> Land irrigated through Government operated distribution system only does not include approximately 10,000 acres in Picacho, Island, and Tornillo still irrigating from community ditch diverting direct from the river.

<sup>2</sup> Includes 1,120 acres in Fort Hancock.

<sup>3</sup> Measured at point of delivery from canals.

<sup>4</sup> Total diversions, including water wasted and rediverted from river below.

<sup>5</sup> Includes delivery to farms by Bureau of Reclamation operation and to heads of community ditches on project.

<sup>6</sup> Includes 548 acres in Palomas and 4,821 acres in Fort Hancock outside project limits irrigated under surplus stored water contract.

*Settlement data Rio Grande project.*

Item.	1918	1919	1920	1921	1922
Total number of farms.....	2,287	2,703	3,021	3,204	3,534
Population.....	10,259	12,890	12,199	11,774	11,267
Number of irrigated farms.....	2,287	2,703	3,021	3,222	3,534
Operated by owners.....	1,377	1,966	2,668	2,628	2,954
Operated by tenants.....	910	737	353	594	580
Number of towns.....	27	27	29	29	34
Population.....	87,997	89,316	<sup>1</sup> 100,235	101,235	110,442
Total population in towns and on farms....	98,256	102,206	112,434	113,009	121,709
Number of public schools.....	52	54	102	103	49
Number of churches.....	82	53	105	106	110
Number of banks.....	18	17	14	13	13
Total amount of capital stock.....	\$3,000,000	\$3,250,000	\$2,990,000	\$2,950,000	\$2,950,000
Amount of deposits.....	\$32,000,000	\$32,000,000	\$30,898,499	\$28,194,815	\$30,000,000
Number of depositors.....	40,000	44,000	31,716	30,000	31,000

<sup>1</sup> 5,000 soldiers included in El Paso's population.

# NORTH DAKOTA, WILLISTON PROJECT.

(Heretofore known as North Dakota Pumping project).

WILLIAM S. ARTHUR, project manager, Williston, N. Dak.

The Williston project is located in Williams County, N. Dak., on the Great Northern Railway. Williston is the principal town and the project headquarters. The Missouri River is the source of water supply. The irrigation season is 80 days; the average rainfall is 13 inches; the average high temperature is 99° and the average low -37° F. The principal products are alfalfa, dairy cows and hogs, corn, and potatoes. Public farm units are limited to 80 acres and private to 160 acres.

A central steam power plant is located near Williston adjoining Government-owned coal lands, where electrical energy is generated for the operation of the pumping stations, of which there are four. The plan of the Williston division provides for a series of motor-driven centrifugal pumps on a barge in the Missouri River, a settling basin receiving the water from the barge, and a main canal of 90 second-feet capacity extending along Little Muddy Creek to the power plant where two sets of steam-driven turbines operate centrifugal pumps for the higher lifts. From the main canal, about midway between the river and the power plant, electrically-driven pumps raise water 28 feet for the lands on the west side of Little Muddy Creek.

## SUMMARY OF DATA FOR WILLISTON PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete .....	10,753	
Public land entered to June 30, 1923 .....	254	
Public land open to entry on June 30, 1923 .....	130	
State land unsold on June 30, 1923 .....	23	
Private land, June 30, 1923 .....	10,337	
Acreage bureau could supply, season of 1922 .....	7,653	
Acreage irrigated, season of 1922 .....	1,533	
Acreage cropped under irrigation, season of 1922 .....	1,671	
Acreage dry farmed, season of 1922 .....	2,500	
Value of irrigated crops, season of 1922 .....	\$52,230	
Value of irrigated crops per acre cropped .....	\$33.24	
Value of dry-farmed crops, season of 1922 .....	\$25,000	
Value of dry-farmed crops per acre cropped .....	\$10	
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations .....	\$167,633.48	
Disbursements and liabilities .....	74,912.08	
Unencumbered balance June 30, 1923 .....	\$92,771.40	
Fiscal year 1924, amount specified in appropriation act .....	100,000.00	

## HERETOFORE KNOWN AS WILLISTON DIVISION NORTH DAKOTA PUMPING PROJECT.

	Fiscal year 1923.	To June 30, 1923.
Net construction cost .....	\$421.43	\$460,107.18
Less—		
Loss <sup>1</sup> .....	77,080.88	
Water-rights contracts, project lands 7,653 acres .....		290,308.74
Total .....	77,080.88	290,308.74
Balance .....	76,609.45	169,308.44

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost .....	\$20,720.65	\$342,635.87	\$28,796.05	\$357,244.00
Less—				
Loss .....		178,667.20		178,667.20
Charges billed or contracted <sup>2</sup> .....	19,673.71	162,249.91	9,867.83	158,349.82
Penalties .....	1,055.94	1,918.76	630.00	1,918.76
Total .....	20,720.65	342,635.87	10,457.83	338,935.78
Balance .....			18,308.22	18,308.22

<sup>1</sup> Contra.

<sup>2</sup> Adjustment of loss so as to confine amount to abandoned Buford Trenton division.

<sup>3</sup> Includes amount irrigation district has agreed to pay, but is not yet due.

*Summary of data for Williston project to end of fiscal year 1923—Continued.*

Investment to date.	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$1,189,089.68	\$22,534.51	\$1,211,624.19
Less collections.....	412,450.03		412,450.03
Net investment June 30, 1923.....	776,639.65	22,534.51	799,174.16

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected cash.		Collected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	
Construction charges paid in advance.....				\$8,250.63	
To return net operation and maintenance cost:					
Operation and maintenance charges, project lands (6,587.4 acres).....	\$25,899.10	\$71,920.30	\$1,370.00	26,677.75	\$45,242.55
Penalties.....			630.00	1,918.76	
Revenues:					
Rentals of irrigating water.....		2,117.28		2,117.28	
Rentals of power and light.....	49,570.46	365,647.50	49,814.46	362,133.00	3,514.50
Rentals of grazing and farming lands.....		249.98		249.98	
Total.....	49,570.46	368,014.76	49,814.46	364,500.26	3,514.50
Miscellaneous uncollected.....					129.39
Other miscellaneous collections.....			530.87	11,102.63	
Grand total collections.....			52,345.33	412,450.03	

## BUFORD TRENTON DIVISION (ABANDONED).

	Fiscal year 1923.	To June 30, 1923.
Net construction cost.....	<sup>1</sup> \$1,099.26	\$223,168.96
Less loss.....	<sup>1</sup> 1,099.26	223,168.96
	To Dec. 31, 1922.	To June 30, 1923.
Net operation and maintenance cost.....	\$73,466.80	\$73,466.80
Less:		
Loss.....	71,149.39	71,149.39
Charges billed.....	2,317.41	2,317.41
Total.....	73,466.80	73,466.80

<sup>1</sup> Contra.

Investment to date:	Reclamation fund.
Disbursements and net transfers.....	\$311,229.60
Less collections.....	17,432.93
Net investment June 30, 1923.....	293,796.67

*Status of current accounts receivable as of June 30, 1923.*

	Due to June 30, 1923.	Collected—cash.	
		Fiscal year 1923.	To June 30, 1923.
To return net operation and maintenance cost:			
Operation and maintenance charges.....	\$2,317.41	.....	2,317.41
Revenues:			
Rentals of irrigation water.....	31.75	.....	31.75
Rentals of grazing and farming lands.....	423.93	.....	423.93
Total.....	455.68	.....	455.68
Other miscellaneous collections.....		\$26.00	14,659.84
Grand total collections.....		26.00	17,482.93

### ACTIVITIES DURING THE FISCAL YEAR.

Two miles of small laterals were constructed. Wooden turnouts, crossings, and culverts were placed principally to replace others that were installed as a part of original construction. Three miles of laterals partially constructed in 1922 were brought up to capacity.

The commercial power contract with the city of Williston expired December 20, 1922, but before its expiration a new contract was executed with the city. The contract is for a period of 10 years, with provision for termination and for revision of rates and terms on 1 year's notice. Competition developed which endeavored to get the contract placed with private parties; but the officials of the city, maintaining their interest in the development of the project, executed the contract at rates which are estimated to yield 18 per cent more than the rates quoted by the competitors. The operation of the project is infeasible in its present stage of development without this commercial power contract, which makes it possible to hold together the principal parts of an operating organization throughout the year. Such an organization could not be disbanded and reassembled each year for irrigation operations alone. The commercial power output is now running about 5 per cent higher than in 1922.

The project mines its own coal from public lands adjoining the powerhouse site, and this mine, which is the only Government-operated coal mine in the United States, is a unique feature of the project; 12,180 tons of coal were mined at a cost of \$29,173 or \$2.39 per ton. The cost is 38 cents per ton higher than during the previous fiscal year owing to two causes—a smaller consumption in the irrigation months and new track and development, consisting exclusively of narrow work, the cost of which is included in the fiscal year 1923, whereas the benefits will be derived chiefly in the fiscal year 1924. The cost was 36 cents per ton below the average of the community.

### SETTLEMENT AND DEVELOPMENT.

There is no public land available for entry. The problem is to reduce the size of private holdings, but here, as elsewhere in the United States, the tendency of the population is away from the farms to urban settlements.



*Operation data, Williston project.*

Item.	1919	1920	1921	1922
Area for which bureau was prepared to supply water.....	8,199	7,653	7,653	7,653
Acreage irrigated.....	2,446	2,810	2,080	1,583
Miles of canal operated.....	31	31	35	35
Water diverted (acre-feet).....	4,028	4,000	2,383	1,942
Water delivered to land (acre-feet).....	2,633	2,684	1,624	1,352
Water per acre of land irrigated (acre-feet).....	1.06	0.97	0.78	0.86

*Settlement data, Williston project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	105	105	105	105	105	105
Population.....	190	195	200	200	210	220
Total number of irrigated farms.....				94	76	73
Operated by owners or managers.....	34	33	33	47	39	40
Operated by tenants.....	10	11	24	19	12	9
Operated by nonresidents.....				28	25	24
Population.....	155	160	181	194	200	212
Number of towns.....	2	2	2	2	2	2
Population.....	5,300	5,360	5,400	5,000	5,000	4,500
Population in towns and on farms.....	5,490	5,555	5,600	5,200	5,210	4,720
Number of public schools.....	6	6	6	6	6	6
Number of churches.....	6	6	6	6	7	7
Number of banks.....	4	4	4	3	3	2
Total capital stock.....	\$235,000	\$260,000	\$260,000	\$260,000	\$260,000	\$185,000
Amount of deposits.....	\$1,800,000	\$2,000,000	\$1,756,000	\$2,000,000	\$1,800,000	\$1,700,000
Number of depositors.....	3,500	3,800	3,800	5,010	3,800	3,500

## OREGON, UMATILLA PROJECT.

H. M. SCHILLING, project manager, Hermiston, Oreg.

The Umatilla project is located in Umatilla and Morrow Counties and is traversed by the main line railroad of the Oregon-Washington Railroad and Navigation Co. The project towns are Hermiston, Umatilla, Irrigon, and Boardman.

The source of water supply is the Umatilla River, which has a drainage area covering 2,160 square miles. The mean annual run-off is 520,000 acre-feet.

The average elevation of the irrigable area is 470 feet above sea level, the average rainfall of 14 years is 8.62 inches, and the length of the irrigation season is 210 days. The principal products are alfalfa, fruits, vegetables, honey, and dairy produce. The building charges per acre of irrigable land are \$60, \$70, and \$92, and the minimum charge for operation and maintenance for the irrigation season of 1922 is estimated to be \$1.60 per acre for the East division, and \$1.50 per acre for the West division, the respective irrigation districts being obligated to pay the total costs incurred by contract.

The irrigation plan of the east division provides for the diversion of water from the Umatilla River above Echo, Oreg., through a feed canal 24.5 miles in length to the Cold Springs Reservoir, which has a storage capacity of 50,000 acre-feet, whence it is delivered directly to the land through a system of canals and laterals. Water is also diverted from the Umatilla River near the mouth of Butter Creek by the Maxwell Canal and when available supplements that discharged from the reservoir.

For the west division water is diverted from the Umatilla River about halfway between Hermiston and Umatilla and is delivered directly to lands bordering the Columbia River in the vicinity of Umatilla, Irrigon, and Boardman.

### SUMMARY OF DATA FOR UMATILLA PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		28,300
Public land entered to June 30, 1923.....	5,413	
Public land withdrawn on June 30, 1923.....	2,376	
Railroad land unsold on June 30, 1923.....	3,319	
Other private land, June 30, 1923.....	17,192	
Acreage bureau could supply, season of 1922.....		24,502
Acreage irrigated, season of 1922.....		13,273
Acreage cropped under irrigation, season 1922.....		10,188
Value of irrigated crops, season of 1922.....		\$519,468
Value of irrigated crops per acre cropped.....		\$50.99
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations.....		\$465,023.17
Disbursements and liabilities.....		310,396.06
Unencumbered balance June 30, 1923.....		124,627.11
Fiscal year 1924, amount specified in appropriation act.....		900,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$75,142.70	\$2,874,027.84
<b>Less:</b>		
Water-right contracts—		
Project lands (24,347 acres).....	17,969.48	2,700,273.97
Other lands (approximately 120 acres).....		4,800.00
<b>Total.....</b>	<b>17,969.48</b>	<b>2,705,073.97</b>
<b>Balance.....</b>	<b>57,173.22</b>	<b>168,953.87</b>

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$34,198.79	\$324,976.70	\$34,732.77	\$343,488.77
<b>Less:</b>				
Charges billed or contracted.....	36,068.31	331,517.95	36,068.31	331,517.95
Penalties.....	1,363.11	7,509.80	1,573.97	6,347.67
Discounts.....		1,277.56	18.87	1,286.43
<b>Total.....</b>	<b>37,431.42</b>	<b>335,750.19</b>	<b>35,485.47</b>	<b>334,579.09</b>
<b>Balance.....</b>	<b>1,323.63</b>	<b>10,773.49</b>	<b>1,752.70</b>	<b>8,909.68</b>

<sup>1</sup> Contra.

*Summary of data for Umatilla project to end of fiscal year 1923—Continued.*

	Reclamation fund.	Increase of compensation (net).	Total.
<b>Investment:</b>			
Disbursements and net transfers.....	\$3,368,737.47	\$37,159.53	\$3,405,897.00
Less collections.....	824,264.61		824,264.61
Net investment June 30, 1923.....	2,544,472.86	37,159.53	2,581,632.39

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges.....	\$65,142.17	\$406,632.51	\$51,583.91	\$356,599.38	.....	\$50,033.13
Charges paid in advance.....			<sup>1</sup> 1,932.69	17,320.38		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (24,347 acres).....	28,856.06	279,386.24	30,688.24	244,462.03	\$3,286.43	31,637.78
Other lands, approximately 120 acres.....	71.00	474.95	48.00	451.95	.....	23.00
Total.....	28,927.06	279,861.19	30,736.24	244,913.98	3,286.43	31,660.78
Charges paid in advance.....			<sup>1</sup> 144.96	390.00		
Penalties and interest.....			<sup>1</sup> 573.97	6,347.57		
Revenues:						
Rentals of irrigating water....	1,314.15	32,100.24	2,290.19	32,100.24		
Rentals of grazing and farming lands.....	570.90	1,579.50	520.90	1,529.50	.....	50.00
Total.....	1,885.05	33,679.74	2,811.09	33,629.74		50.00
Miscellaneous uncollected.....						332.98
Other miscellaneous collections (Receiving fund).....			8,214.75	165,063.56		
Grand total collections.....			90,694.37	824,264.61		

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1923, 12 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1923, 11 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

*East division.*—The principal construction work in progress was the continuation of the improvement of the A Canal, of which 1.6 miles were enlarged and lined, involving the excavation of 15,038 cubic yards of class 1 material and the placing of 1,465 cubic yards of concrete lining. Two timber bridges were rebuilt and eight minor structures built in connection with the A Canal improvements.

In connection with betterments to the irrigation system as provided in the contract with the Hermiston irrigation district, 600 linear feet of B-3 Canal were lined. One timber bridge was rebuilt over the Hermiston drain.

The construction of lateral extensions was continued, about 5.7 miles of lateral being built; 500 linear feet of 24-inch, 9,432 linear feet of 20-inch, 12,707 linear feet of 16-inch, and 7,303 linear feet of

12-inch concrete pipe were laid, and 72 minor structures, containing 136 cubic yards of concrete, were built. All pipe used was manufactured by Government forces.

*West division.*—Original lateral construction was carried on intermittently throughout the year. The main canal was extended 1 mile to station 1453 + 00 and 1.4 miles of lateral were built; 3,438 linear feet of 16-inch and 2,837 linear feet of 15-inch concrete pipe were laid, 76 cubic yards of 2-inch concrete lining were placed, and 18 minor structures containing 25 cubic yards of concrete were built.

### CROPS AND DEVELOPMENT.

Agricultural conditions were somewhat improved. Alfalfa brought a fair price. The number of dairy stock materially increased and the creamery at Hermiston furnished a cash market for cream. A few farmers are attempting diversification of crops and it is believed the movement will spread. Chickens and bees have proved good investments.

*Operation data, Umatilla project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Area for which bureau was prepared to supply water.....	24,247	24,300	24,300	24,395	24,400	24,592
Miles of canal operated.....	165	177	177	177	177	186
Acreage irrigated.....	7,327	9,100	10,533	12,030	13,150	13,273
Water diverted (acre-feet).....	99,900	118,154	162,850	165,534	130,872	129,187
Water delivered to land (acre-feet).....	45,365	48,163	53,550	50,651	57,492	59,313
Per acre of land irrigated (acre-feet).....	6.10	5.61	5.10	4.21	4.37	4.47

*Settlement data, Umatilla project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	869	875	1,000	1,000	1,000
Population.....	1,127	1,200	1,472	1,562	1,613
Number of irrigated farms.....	456	500	528	544	558
Operated by owners or managers.....	339	350	450	442	435
Operated by tenants.....	120	150	78	102	123
Population.....	1,200	1,200	1,280	1,562	1,613
Number of towns.....	4	4	4	4	4
Population.....	1,200	1,200	1,280	1,280	1,280
Population in towns and farms.....	2,327	2,400	2,752	2,842	2,893
Number of public schools.....	6	6	6	6	6
Number of churches.....	9	9	9	9	9
Number of banks.....	1	1	1	1	1
Capital stock.....	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Amount of deposits.....	\$170,000	\$232,000	\$217,590	\$235,367	\$300,000
Number of depositors.....	1,000	1,129	1,200	1,200	1,200

## OREGON-CALIFORNIA, KLAMATH PROJECT.

HERBERT D. NEWELL, project manager, Klamath Falls, Oreg.

The Klamath project is located in southern Oregon and northern California. The project is served by the Southern Pacific and the Oregon California and Eastern Railroads; Klamath Falls, with a population of about 5,500, is the principal project city, is the center of an extensive lumber industry, and as a shipping point ranks second in the State.

The average elevation of the irrigable lands is about 4,100 feet above sea level. The principal agricultural products are alfalfa and grain; stock raising is practiced to a large extent; the dairying industry, begun several years ago, is increasing rapidly. The principal markets are Portland, Oreg., Sacramento, and San Francisco, Calif. The irrigation season usually begins about May 1 and ends on September 30.

The project derives its water supply principally from the Upper Klamath Lake, which is situated just north of Klamath Falls. Water for irrigation is diverted into the main canal at the lower end of the lake; a short distance below the point of diversion the main canal passes under the city of Klamath Falls by means of a concrete-lined tunnel 3,300 feet in length.

An important feature of the project is the reclamation of the bed of Tule Lake. The lands are first uncovered by causing the waters to recede; later the necessary irrigation works will be constructed. Tule Lake has no visible outlet; the lake-bed lands are being uncovered by the prevention of inflow and by evaporation. The principal works designed to prevent inflow are the Clear Lake Reservoir and the Lost River diversion canal. Clear Lake is located on the headwaters of Lost River and is in effect an evaporating basin covering an area of about 25,000 acres; surplus storage is available for the irrigation of about 12,000 acres. The diversion canal connects Lost River with the Klamath River; this canal diverts water entering Lost River below the Clear Lake Dam to the Klamath River.

About 20,000 acres in Langell Valley and 10,000 acres near Bonanza will be watered from Clear Lake Reservoir, the proposed Gerber Reservoir, and springs tributary to Lost River.

### SUMMARY OF DATA FOR KLAMATH PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		169,897
Public land entered to June 30, 1923.....	5,917	
Public land withdrawn on June 30, 1923.....	20,776	
Private land, June 30, 1923.....	142,704	
Acreage bureau could supply, season of 1922.....		51,000
Acreage irrigated, season of 1922.....		136,000
Acreage cropped under irrigation, season of 1922.....		32,960
Value of irrigated crops, season of 1922.....		\$537,140.00
Value of irrigated crops per acre cropped.....		\$16.30
<b>Finances:</b>		
<b>Appropriations—</b>		
Fiscal year 1923, amount of congressional authorizations.....	\$665,028.17	
Disbursements and liabilities.....	545,604.61	
Unencumbered balance June 30, 1923.....		\$119,423.66
Fiscal year 1924, amount specified in appropriation act.....		700,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$437,841.89	\$3,978,175.73
<b>Less water right contracts—</b>		
Project lands (45,263 acres).....	279,646.45	2,100,389.75
Warren Act lands (approximately 58,968 acres).....	789,376.00	931,981.24
Other lands (approximately 22,072 acres).....		133,888.40
Total.....	1,069,022.45	3,166,259.39
Balance.....	\$ 631,180.56	811,916.34

<sup>1</sup> Total irrigated area, 44,929 acres, including 8,929 acres of Van Brimmer lands and in miscellaneous pumping districts.

<sup>2</sup> Contra.

## Summary of data for Klamath project to end of fiscal year 1923—Continued.

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$42,186.04	\$544,908.95	\$53,028.23	\$578,556.15
Less:				
Charges billed or contracted.....	43,760.84	559,156.92	54,871.96	559,156.92
Penalties.....	938.09	2,657.63	68.12	2,691.90
Discounts.....	* 48.09	* 4,420.20	* 45.45	* 4,465.65
Total.....	44,650.84	557,894.35	54,894.63	557,383.17
Balance.....	* 2,464.80	* 12,485.40	* 1,866.40	21,172.98
		Reclamation fund.	Increase compensa- tion (net).	Total.
Investment:				
Disbursements and net transfers.....		\$4,814,059.69	\$63,144.96	\$4,877,204.65
Less collections.....		1,224,499.68		1,224,499.68
Net investment June 30, 1923.....		3,589,560.01	63,144.96	3,652,704.97

\* Contra.

## Status of current accounts receivable as of June 30, 1923.

	Due.		Collected.			Uncol- lected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges.....	\$65,525.88	\$567,811.58	\$61,373.28	\$537,270.01	.....	\$30,541.57
Charges paid in advance.....			100.10	422.71	.....	
To return net operation and maintenance cost:						
Operation and mainte- nance charges, project lands (42,004 acres).....	63,186.65	490,614.60	49,877.10	409,491.78	\$30,059.60	51,063.22
Warren Act lands (ap- proximately 8,335 acres)	632.96	2,092.32	556.64	1,939.68	.....	152.64
Other lands (approx- imately 5,000 acres).....		200.00			.....	200.00
Total.....	63,819.61	492,906.92	50,433.74	411,431.46	30,059.60	51,415.86
Charges paid in advance.....			* 52.09	55.81		
Penalties and interest.....			68.12	2,691.90		
Revenues:						
Rentals of irrigating water.....	824.01	43,013.63	871.87	42,537.83		475.80
Rentals of power and light.....	2,214.83	8,234.83	2,214.83	8,234.83		
Rentals of grazing and farming lands <sup>1</sup> .....	143,053.67	158,406.16	145,306.39	157,962.16		444.00
Total.....	146,092.51	209,654.62	148,393.09	208,734.82		* 919.80
Miscellaneous uncollected.....						2,602.89
Other miscellaneous collec- tions (reclamation fund).....			* 122,234.53	63,892.97		
Grand total collections.....			138,081.71	1,224,499.66	.....	

\* Contra.

	Accrued.	Collected.
<sup>1</sup> Fiscal year 1923.....	\$16,792.23	\$19,044.95
Prior (adjustment).....	126,261.44	126,261.44
Total.....	143,053.67	145,303.39

Uncollected construction water-right charges as of June 30, 1923, 5.4 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 10.4 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

*Storage system.*—At the dam site for the Gerber Reservoir detail investigations were made to determine foundation conditions. Eight test pits were excavated to a depth sufficient to permit a thorough examination. The indications are that a suitable foundation can be secured at a depth not to exceed 20 feet below the surface.

*Tule Lake division.*—The canal and lateral system had been completed for an area of 10,000 acres. For the irrigation of the lands in this division 14 miles of canal and 37 miles of laterals had been constructed by Government forces using drag-line excavators. A total of 395 timber structures and 95 structures of reinforced concrete had been installed, practically all by contract.

*Langell Valley division.*—The Malone diversion dam on Lost River was completed, the principal quantities in the dam being 425 cubic yards of concrete and 18,500 cubic yards of earth embankment. The purpose of the dam is to divert water into the west canal for the irrigation of lands on the west side of Langell Valley. The lower 3 miles of the west canal were constructed by contract. The upper 9 miles were being constructed by Government forces using a drag-line excavator. Contracts had been let for the construction of bridges, checks, and turnouts, and also for the hydraulic pumping plant for the Dry Lake area.

On June 18, the Langell Valley irrigation district executed a contract with the United States providing for the construction of the Gerber Reservoir and the irrigation of lands east of Lost River.

*Operation data, Klamath project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	44,000	50,000	50,000	50,000	51,000	51,000
Acreage irrigated.....	33,635	38,269	42,881	44,880	44,883	<sup>1</sup> 44,929
Miles of canal operated.....	216	210	225	225	225	225
Water diverted (acre-feet).....	66,368	104,926	119,850	114,179	106,104	119,530
Water delivered to land (acre-feet).....	32,780	52,090	56,490	49,754	48,713	49,862
Per acre of land irrigated (acre-feet)...	0.975	1.36	1.32	1.11	1.11	1.11

<sup>1</sup> Includes 8,929 acres of Van Brimmer land and in miscellaneous pumping divisions.

*Settlement data, Klamath project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	560	570	570	570	570
Population.....	1,800	2,000	2,050	2,200	2,200
Number of irrigated farms.....	530	540	542	542	542
Operated by owners or managers.....	340	350	352	430	430
Operated by tenants.....	190	190	190	112	112
Population.....	1,510	1,600	1,650	1,720	1,720
Number of towns.....	4	5	5	5	5
Population.....	5,000	5,300	5,500	5,800	6,200
Total population, towns, and farms.....	6,800	7,300	7,550	8,000	8,400
Number of public schools.....	20	21	21	22	22
Number of churches.....	10	10	10	10	10
Number of banks.....	4	5	6	5	5
Total capital stock.....	\$225,000	\$500,000	\$595,000	\$545,000	\$255,000
Amount of deposits.....	\$2,383,000	\$4,000,000	\$4,500,000	\$3,500,000	\$3,500,000
Number of depositors.....	6,264	6,500	9,250	8,000	8,000

## SOUTH DAKOTA, BELLE FOURCHE PROJECT.

B. E. HAYDEN, project manager, Newell, S. Dak.

The Belle Fourche project is located in western South Dakota, a little north and east of the Black Hills. The district is served by the Chicago & North Western Railway, which runs into the heart of the project, and the Burlington Railway, which runs into the Black Hills. The principal towns are Belle Fourche, Newell, Nisland, and Fruitdale. The source of water supply is the Belle Fourche River. The climate is semiarid, with an average annual rainfall of about 14 inches; the temperature ranges from  $-38^{\circ}$  to  $105^{\circ}$  F. The character of the soils varies from light sandy loam to heavy clay, the clay soils predominating. The duty of water averages 1.5 acre-feet per acre. The principal products are alfalfa, wheat, oats, corn, potatoes, sugar beets, garden truck, and live stock, the chief markets for which are Omaha, Minneapolis, and Chicago.

The irrigation plan provides for the diversion of water from the Belle Fourche River by means of a dam about  $1\frac{1}{2}$  miles below Belle Fourche, S. Dak., and an inlet or supply canal about  $6\frac{1}{2}$  miles in length into a storage reservoir, controlled by the Belle Fourche Dam on Owl Creek, a tributary of the Belle Fourche River; the distribution of water from the inlet canal to a small area of land, and the distribution of water from the reservoir through two canal systems to lands on both sides of the Belle Fourche River.

### SUMMARY OF DATA FOR BELLE FOURCHE PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		96,431
Public land entered to June 30, 1923.....	37,732	
Public land open to entry on June 30, 1923.....	117	
Public land withdrawn on June 30, 1923.....	12,008	
State land unsold on June 30, 1923.....	667	
Private land, June 30, 1923.....	45,907	
Acreage bureau could supply, season of 1922.....		82,190
Acreage irrigated, season of 1922.....		31,150
Acreage cropped under irrigation, season of 1922.....		56,928
Value of irrigated crops, season of 1922.....		\$585,770
Value of irrigated crops per acre cropped.....		\$10.28
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$335,958.79	
Disbursements and liabilities.....	58,574.06	
Unencumbered balance June 30, 1923.....		\$277,384.73
Fiscal year 1924, amount specified in appropriation act.....		96,000.00

	Fiscal year 1923	To June 30, 1923
<b>Irrigation works:</b>		
Net construction cost.....	<sup>1</sup> \$1,252.56	\$3,567,437.13
Less water-right contracts—		
Project lands (76,511.93 acres).....	<sup>1</sup> 20,568.70	2,595,606.99
Warren Act lands, (54.8 acres).....		1,671.40
Total.....	<sup>1</sup> 20,568.70	2,597,278.39
Balance.....	19,316.14	970,158.74

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$55,685.88	\$622,477.91	\$56,378.71	\$951,665.57
Less—				
Charges billed.....	98,866.84	871,172.72	98,745.18	870,863.27
Penalties.....	2,451.57	15,496.88	1,324.04	15,646.41
Discounts.....	<sup>1</sup> 1,210.11	<sup>1</sup> 12,127.41	<sup>1</sup> 372.15	<sup>1</sup> 12,310.87
Total.....	100,108.30	874,542.19	99,697.07	874,198.81
Balance.....	<sup>1</sup> 44,422.42	47,685.72	<sup>1</sup> 43,318.36	77,466.76

<sup>1</sup> Contra.



*Summary of data for Belle Fourche project to end of fiscal year 1923—Continued.*

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensation (net).	Total.
<b>Investment:</b>				
Disbursements and net transfers.....	\$4,530,758.17	\$37,170.22	\$45,650.63	\$4,613,579.02
Less collections.....	1,078,483.76			1,078,483.76
Net investment June 30, 1923.....	3,452,274.41	37,170.22	45,650.63	3,535,095.26

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other cred- its to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges....	\$117,996.04	\$749,203.60	\$14,747.62	\$477,672.39	\$219.15	\$271,312.06
Charges paid in ad- vance.....			19.52	388.36		
To return net operation and maintenance cost:						
Operation and mainte- nance charges, project lands (76,511.93 acres).	98,668.46	870,433.99	17,435.61	513,444.05	12,452.64	344,537.30
Warren Act lands (54.8 acres).....	76.72	429.28		46.00		353.28
Total.....	98,745.18	870,863.27	17,435.61	513,490.05	12,452.64	344,920.58
Charges paid in advance.....			206.13	39.73		
Penalties and interest.....			1,269.53	15,557.84	88.57	
Revenues:						
Rentals of irrigating water.....	408.72	5,060.10	408.72	4,910.10		150.00
Rentals of grazing and farm lands.....	318.77	318.77	318.77	318.77		
Total.....	727.49	5,378.87	727.49	5,228.87		150.00
Miscellaneous uncollected.....						366.26
Other miscellaneous col- lections (reclamation fund).....			3,545.54	66,106.52		
Grand total col- lections.....			37,500.14	1,078,483.76		

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1923, 36.2 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 39.6 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

Activities on the project during the year were confined to operation and maintenance of the completed system.

The crop season of 1922 experienced heavy precipitation during the growing period, which resulted in a small demand for water and a minimum area irrigated. Only about half of the land in crop received irrigation water. The growth and yield of crops were good, but on account of too much precipitation in June and July practically all of the first cutting of alfalfa was seriously damaged. Other crops harvested were satisfactory.

Precipitation for the year was 16.1 inches, and for April, May, June, and July was 9.8 inches. The total flow of the Belle Fourche River was 369,681 acre-feet. Storage in the Belle Fourche Reservoir on June 30 was 176,900 acre-feet.

On May 12, 1922, a severe wind storm, blowing at the rate of 75 to 80 miles per hour, dislodged about 80 pavement blocks on the Belle Fourche Dam. Temporary repair was made by slipping timber curtains over the rupture and later permanent repair was made by back-filling and covering with a reinforced concrete slab. The parapet wall for a distance of 2,100 feet was being raised to prevent waves during heavy storms shooting over the top of the dam. At the close of the year 1,200 feet of this work had been completed.

The most important occurrence during the year was the formation of an irrigation district to take the place of the water users' association. It is expected that a contract providing for the payment in full by the district of costs incurred by the United States and granting certain relief in payments will be signed by the United States, the district, and the association.

*Operation data, Belle Fourche project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	82,592	82,634	82,430	83,328	82,190
Acreage irrigated.....	82,448	86,638	89,850	85,100	81,150
Miles of canal operated.....	612	615	615	615	615
Water diverted (acre-feet) from Belle Fourche River.....	194,364	121,293	101,113	86,791	115,629
Water delivered to farms (acre-feet).....	51,731	82,409	36,616	71,715	28,421
Per acre of land irrigated (acre-feet).....	0.99	1.46	0.61	1.3	1.09

*Settlement data, Belle Fourche project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	1,292	1,292	1,292	1,292	1,292
Population.....	2,675	2,675	2,700	2,700	2,700
Number of irrigated farms.....	906	1,000	1,024	1,033	1,035
Operated by owners or managers.....	590	668	692	451	833
Operated by tenants.....	316	332	332	582	116
Population.....	2,424	2,697	2,650	2,510	2,213
Number of towns.....	5	5	5	5	5
Population.....	2,100	2,200	2,850	2,896	2,896
Total population in towns and on farms.....	4,775	4,875	5,050	5,086	5,086
Number of public schools.....	24	24	28	24	24
Number of churches.....	11	11	9	9	9
Number of banks.....	9	9	9	9	9
Total capital stock.....			\$250,000	\$250,000	\$250,000
Amount of deposits.....	\$2,391,262	\$3,837,680	\$2,657,621	\$2,373,380	\$2,608,200
Number of depositors.....			6,560		6,560

<sup>1</sup> 86 farms not operated.

<sup>2</sup> Estimated.

## UTAH, STRAWBERRY VALLEY PROJECT.

W. L. WHITEMORE, project manager, Provo, Utah.

The Strawberry Valley project is located in the north central part of Utah; the irri-gable area lies along the southeastern shore of Utah Lake, in Utah County, and the storage works in Wasatch County, 30 miles east of Springville. The irrigation plan provides for the storage of water in Strawberry Reservoir, the carriage of these stored waters through Strawberry tunnel, approximately 4 miles long, into Diamond Fork, a tributary of the Spanish Fork River, and the diversion of water from this stream through canal systems to the irrigable area.

The length of the irrigation season is 169 days, from April 15 to September 30. The average elevation of the project lands is about 4,600 feet above sea level. The average rainfall at Payson for a period of 16 years is 18½ inches, most of which occurs from September 1 to May 1. The climate is temperate, varying from 95° F. in summer to 0° F. in winter. The last killing frost in the spring usually occurs prior to May 10 and the first in the fall after October 1. The soil varies from sandy loam to heavy clay and varying mixtures of both, with black alluvium and loam in the bottom lands. The mesa lands are sandy loam overlaid with gravel so that natural drainage is excellent. All soils are easily worked and extremely fertile if properly cultivated, and are suitable for raising any crop that will grow in the Temperate Zone. The principal crops are wheat, oats, barley, millet, alfalfa, timothy, sugar beets, potatoes, corn, cane, apples, plums, pears, peaches, prunes, apricots, cherries, melons, and all kinds of vegetables. The sugar beet, cereal, and hay crops constitute the staple crops under the project.

The project is traversed by two transcontinental railroad lines, the Denver & Rio Grande Western and the Los Angeles and Salt Lake (Union Pacific system). There is also a local electric interurban line connecting the main project towns with Salt Lake City and points in northern Utah.

### SUMMARY OF DATA FOR STRAWBERRY VALLEY PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....	55,389
Public land entered to June 30, 1923.....	1,953
Private land, June 30, 1923.....	53,436
Acreage bureau could supply, season of 1922.....	53,889
Acreage irrigated, season of 1922.....	13,47,446
Acreage cropped under irrigation, season of 1922.....	13,47,201
Value of irrigated crops, season of 1922.....	\$1,426,335.00
Value of irrigated crops per acre cropped.....	\$80.22

#### Finances:

Appropriations—	
Fiscal year 1923, amount of congressional authorizations.....	\$135,464.52
Disbursements and liabilities.....	42,774.75
Unencumbered balance, June 30, 1923.....	\$92,689.77
Fiscal year 1924, amount specified in appropriation act.....	45,000.00

	Fiscal year, 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$5,493.80	\$3,466,968.00
<b>Less water-right contracts—</b>		
Project lands (19,153 acres).....	1,100.00	1,577,138.90
Warren Act lands (approximately 15,335 acres).....		644,580.00
Other lands (approximately 12,958 acres).....		862,380.47
Total (47,446 acres).....	1,100.00	3,084,099.37
Balance.....	\$ 6,593.80	382,868.63

<sup>1</sup> Includes High Line and Spanish Fork divisions and Springville and Mapleton irrigation districts.

<sup>2</sup> Project lands, 32,500.

<sup>3</sup> Project lands, 31,201.

<sup>4</sup> Project lands, \$904,839.

<sup>5</sup> Project lands, \$29.

<sup>6</sup> Contra.

## Summary of data for Strawberry Valley project to end of fiscal year 1923—Continued.

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$39,926.90	\$341,502.04	\$24,415.90	\$352,264.65
Less:				
Charges billed or contracted.....	60,835.32	277,137.19	128,384.71	351,748.02
Penalties.....	1,411.31	2,242.15	1,280.82	2,789.26
Discounts.....	\$ 1,066.34	\$ 7,966.08	\$ 1,415.40	\$ 8,354.09
Total.....	61,190.29	271,384.31	128,250.13	346,183.18
Balance.....	\$ 21,263.39	70,117.73	\$ 108,634.23	6,071.47

	Reclamation fund.	Judgments, Court of Claims.	Increase of compensation (net).	Total.
Investment:				
Disbursements and net transfers.....	\$4,155,102.04	\$440.00	\$31,198.58	\$4,186,740.62
Less collections.....	1,128,320.75			1,128,320.75
Net investment, June 30, 1923.....	3,026,781.29	440.00	31,198.58	3,058,419.87

<sup>1</sup> Accrued, \$54,625.28; deferred charges (tunnel repairs), \$74,610.83; suspended, contra, \$851.40.

<sup>2</sup> Contra.

## Status of current accounts receivable as of June 30, 1923.

	Due.		Collected.			Uncol- lected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits, June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction costs:						
Water-right charges .....	\$120,520.50	\$476,345.47	\$82,707.41	\$396,306.76		\$79,948.71
Charges paid in advance .....			128.06	186.12		
To return net operation and maintenance cost:						
Operation and maintenance charges, project lands (19,153 acres) .....	29,187.75	156,866.46	22,517.51	129,205.04	\$4,948.27	22,713.15
Warren Act lands (approx- imately 15,335 acres) .....	\$ 8,592.91	37,391.91	12,678.39	36,361.26	666.15	334.50
Other lands (approximately 12,958 acres) .....	15,993.22	82,878.82	14,249.12	75,419.97	2,709.67	4,749.18
Total (47,446 acres) .....	53,773.88	277,137.19	49,445.02	240,986.27	8,354.09	27,796.83
Charges paid in advance .....			.04	.04		
Penalties and interest .....			1,280.82	2,789.25		
Revenues:						
Rentals of irrigating water .....		8,388.39		8,388.39		
Rentals of power and light .....	23,961.48	127,048.89	23,741.72	125,210.42		1,838.47
Rentals of grazing and farm- ing lands .....	15,250.50	135,781.16	15,250.50	135,781.16		
Total .....	39,211.98	271,218.44	38,992.22	269,379.97		1,838.47
Miscellaneous uncollected .....						76.34
Other miscellaneous collections (Reclamation fund) .....			5,669.04	218,582.31		
Grand total collections .....			178,222.61	1,128,320.75		

<sup>1</sup> Accruals for the year..... \$123,079.33  
Less adjustments..... 2,558.83

Net..... 120,520.50

<sup>2</sup> Accruals for the year..... \$9,444.31  
Less adjustments..... 851.40

Net..... 8,592.91

Uncollected construction water-right charges as of June 30, 1923, 16.8 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1923, 10 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

All activities during the year were confined to routine operation and maintenance work in connection with measurement and delivery of irrigation waters in bulk to the several divisions of the project. The water supply of the project was ample for all purposes. Strawberry Reservoir was filled just prior to the beginning of the fiscal year and again at its close. Indications at the close of the year pointed to an abundant harvest in all crops. Financial conditions were much improved, with a general feeling of optimism prevailing among the water users.

The project power plant and transmission lines were in continuous operation, delivering under contract 1,177,993 kilowatt hours to the several project towns and lighting companies. New Woodward governors for controlling the two 500 k. v. a. generators were purchased but not installed.

Spanish Fork diversion dam and power canal were operated without difficulty. The canal was cleaned prior to the beginning of the present irrigation season, and extensive repairs and enlargements were made to the upper plunge basin at the power plant during November, 1922.

*Operation data, Strawberry Valley project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	30,000	34,000	45,000	50,000	53,889	53,889
Acreage irrigated.....	28,147	32,539	44,360	45,450	47,446	47,446
Miles of canal operated.....	9.3	9.3	9.3	9.3	9.3	9.3
Water diverted (acre-feet).....	61,300	55,242	70,467	69,100	83,000	79,500
Water delivered to land (acre-feet).....	51,750	46,250	59,125	57,900	71,200	73,401
Per acre of land irrigated (acre-feet).....	1.84	1.42	1.33	1.27	1.50	1.55

<sup>1</sup> Includes High Line, Spanish Fork, and Springville-Mapleton divisions.

<sup>2</sup> 14,000 acre-feet of free water distributed.

*Settlement data, Strawberry Valley project.*

Item.	1920	1921	1922
Total number of farms on project.....	3,000	3,200	3,200
Population.....	7,000	7,000	7,000
Number of irrigated farms.....	2,700	2,740	2,741
Operated by owners or managers.....	2,200	2,340	2,391
Operated by tenants.....	500	400	450
Population.....	6,500	6,500	6,500
Number of towns.....	12	12	12
Population.....	16,000	16,000	16,000
Total population of towns and farms.....	23,000	23,000	28,000
Number of public schools.....	22	22	23
Number of churches.....	23	28	25
Number of banks.....	6	6	6
Total capital stock.....	\$285,000	\$285,000	\$285,000
Total amount of deposits.....	\$2,180,000	\$1,750,000	\$1,980,000
Total number of depositors.....	9,830	10,000	10,000

## WASHINGTON, OKANOGAN PROJECT.

CALVIN CASTEEL, project manager, Okanogan, Wash.

The Okanogan project is located in Okanogan County, Wash., on a branch line of the Great Northern Railway running from Wenatchee to Oroville, Wash. Towns on the project are Okanogan, Omak and Riverside. The source of water supply is Salmon Creek with storage in Conconully and Salmon Lake Reservoirs. Water is pumped from Okanogan River by the Robinson Flat pumping plant, from Duck Lake by the Duck Lake pumping plant, and from two Government wells to supplement the flow of gravity water from Conconully and Salmon Lake Reservoirs. A pumping plant is also operated at the Salmon Lake Reservoir during dry years which pumps water from Salmon Lake below the elevation at which water can be secured by gravity flow.

The length of the irrigation season is 153 days, from May 1 to September 30. The average elevation is 1,000 feet above sea level; the average rainfall is about 11.5 inches; the temperature ranges from 108° F. to -10° F. The soil is volcanic ash and gravel on the upper benches and sand and gravel on the lowlands along the Okanogan River. The principal crop of the project is apples, with some peaches, pears, small fruits, hay, and vegetables. The principal markets are the States east. The duty of water is 2½ acre-feet per acre per annum at the farm.

### SUMMARY OF DATA FOR OKANOGAN PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....	7,676
Public land entered to June 30, 1923.....	116
Private land, June 30, 1923.....	7,560
Acreage bureau could supply, season of 1923.....	7,676
Acreage irrigated, season of 1923.....	5,570
Acreage cropped under irrigation, season of 1923.....	4,834
Value of irrigated crops, season of 1923.....	\$1,607,140
Value of irrigated crops per acre cropped.....	\$332.45

#### Finances:

Appropriations—	
Fiscal year 1923, amount of congressional authorizations.....	\$67,085.15
Disbursements and liabilities.....	57,189.73
Unencumbered balance June 30, 1923.....	\$9,895.42
Fiscal year, 1924, amount specified in appropriation act.....	65,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$4,317.26	\$1,393,740.41
Less: Water-right contracts—		
Project lands (6,406 acres).....	4,424.00	1,496,579.29
Balance.....	106.74	104,838.88

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
<b>Net operation and maintenance cost.....</b>	\$39,911.49	\$265,594.79	\$43,535.09	\$237,633.34
<b>Less:</b>				
Charges billed or contracted.....	54,829.30	268,341.24	54,914.80	258,241.24
Penalties.....	1,914.77	5,713.85	1,037.67	6,192.60
Discounts.....	13.00	1359.03		1359.03
<b>Total.....</b>	56,741.07	263,696.06	55,952.47	264,174.81
<b>Balance.....</b>	196,652.56	1,898.73	12,417.38	23,458.53

<sup>1</sup> Contra.

<sup>2</sup> Transferred to supplemental construction..... \$31,831.97

Net cost for the year..... 41,920.48

Net (contra)..... 39,911.49

*Summary of data for Okanogan project to end of fiscal year 1923—Continued.*

	Reclamation fund.	Increase of compensation (net).	Total.
Disbursements and net transfers.....	\$1,788,504.46	\$45,128.79	\$1,833,633.25
Less collections.....	424,130.57		424,130.57
Net investment June 30, 1923.....	1,369,373.89	45,128.79	1,404,502.68

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Water-right charges .....	\$5,483.55	\$56,194.73	\$13,154.51	\$54,281.38		\$1,913.36
Charges paid in advance .....			\$ 11.87	146.32		
To return net operation and maintenance cost:						
Operating and maintenance charges (project lands, 6,701 acres) .....	35,991.57	220,967.53	48,844.75	214,634.33	\$2,614.61	3,718.59
Penalties and interest .....			1,001.76	5,614.24	578.36	
Revenues:						
Rentals of irrigation water ..	474.58	110,450.85	362.40	106,222.69	2,584.19	1,643.97
Rentals of power and light ..		1,754.71		1,754.71		
Rentals of grazing and farming lands .....	50.00	722.50	50.00	722.50		
Total .....	524.58	112,928.06	412.40	108,699.90	2,584.19	1,643.97
Miscellaneous uncollected .....						1,136.14
Other miscellaneous collections (reclamation fund) .....			19,342.38	40,754.40		
Grand total collections .....			82,743.93	424,130.57		

<sup>1</sup> Amount due fiscal year 1923..... \$12,608.86  
 Less adjustment account erroneous amount reported previously..... 7,125.31

Net..... 5,483.55

<sup>2</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 3.1 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1923, 1.7 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

One mile of transmission line was erected and electric motors and equipment were purchased to operate five private wells for pumping irrigation water to be used in lieu of gravity water. Three wells had been completed and it was expected that the other two would be finished soon.

In each of the 1922 and 1923 seasons enough water was available to deliver about 2 acre-feet per acre, about 3,000 acre-feet of which were pumped from below the gate sill of Salmon Lake Reservoir. An early spring and heavy rains during the first half of June, 1923, made the water supply much larger than was anticipated. In addition to the oil engine pumping at Salmon Lake, electrical pumps at Robinson Flat, Duck Lake, and the Government wells augmented

the flow of gravity water from Conconully Reservoir. Three private wells also were operated to replace gravity water during the greater part of the irrigation seasons within the fiscal year.

*Operation data, Okanogan project, by calendar years.*

Item.	1918	1919	1920	1921	1922
Acreage for which the bureau was prepared to supply water.....	10,099	10,099	8,200	8,200	7,676
Acreage irrigated.....	6,402	5,849	5,440	5,650	5,570
Miles of canal operated.....	79	79	79	79	79
Water diverted (acre-feet).....	8,827	13,837	8,435	21,866	21,318
Water delivered to land (acre-feet).....	6,339	9,967	5,259	16,706	15,295
Per acre of land irrigated (acre-feet).....	0.99	1.70	0.96	2.96	2.75

*Settlement data, Okanogan project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	594	594	594	439	447
Population.....	1,162	1,147	1,150	1,220	1,363
Number of irrigated farms.....	401	407	400	439	445
Operated by owners.....	378	361	350	388	388
Operated by tenants.....	23	46	50	51	57
Population.....	1,162	1,147	1,150	1,220	1,363
Number of towns.....	8	3	3	3	3
Population.....	1,400	1,520	1,885	2,150	2,300
Total population in towns and on farms.....	2,562	2,667	3,035	3,370	3,663
Number of public schools.....	7	7	5	6	6
Number of churches.....	8	8	8	8	8
Number of banks.....	4	5	5	5	5
Total capital stock.....	\$135,000	\$100,000	\$155,000	\$155,000	\$155,000
Amount of deposits.....	\$500,000	\$600,000	\$1,050,100	\$1,043,000	\$956,000
Number of depositors.....	1,750	1,800	2,100	2,200	2,250



# WASHINGTON, YAKIMA PROJECT.

J. L. LYTEL, project manager, Yakima, Wash.

The Yakima project, comprising the Sunnyside, Tieton, Kittitas, Moxee, Roza, and Kennewick divisions, is located in Kittitas, Yakima, and Benton Counties, Wash. The water supply comes from the Yakima River and its tributaries, supplemented by storage in Keechelus, Kachees, Cle Elum, Bumping, Tieton, and Clear Creek Reservoirs. Sunnyside division diverts water from the east side of the Yakima River at Union Gap for the irrigation of 107,600 acres and Tieton division from the Tieton River, about 15 miles above its mouth, for 32,000 acres. The project plan provides for the ultimate irrigation of 70,287 acres in the Kittitas division with diversion from the Yakima River at Easton, 58,350 acres in the Roza division diverting from the Yakima River about 10 miles above Yakima, 35,000 acres in the Kennewick division diverting from the Yakima River at Prosser, and 36,750 acres in the Moxee division with diversion from the Tieton River about 5 miles above its mouth. The Wapato Indian project, now being constructed by the United States Indian Service, diverts water from the west side of the Yakima River at Union Gap, for the irrigation of 120,000 acres on the Yakima Indian Reservation.

The irrigation season on the Sunnyside division extends from April 1 to October 31 (214 days) and on the Tieton from April 20 to September 30 (164 days). The water duty on the Sunnyside division is 3 acre-feet per acre, and on the Tieton division 2.4 acre-feet per acre. The soil is volcanic ash, sandy loam, and decomposed basalt. The principal products are alfalfa, apples, pears, peaches, grains, potatoes, sugar beets, hops, stock, and dairy products.

Transportation is furnished by the Northern Pacific, Union Pacific, and Chicago, Milwaukee & St. Paul Railways.

## SUMMARY OF DATA FOR YAKIMA PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas and crops:</b>		
Irrigable acreage when project is complete.....		339,987
Public land entered to June 30, 1923.....	7,358	
Public land withdrawn on June 30, 1923.....	13,688	
State land unsold on June 30, 1923.....	5,939	
Indian land, June 30, 1923.....	241	
Railroad land unsold on June 30, 1923.....	21,729	
Other private land, June 30, 1923.....	291,032	
Acreage bureau could supply, season 1922.....		133,339
Acreage irrigated, season of 1922.....		123,700
Acreage cropped under irrigation, season 1922.....		107,161
Value of irrigated crops, season of 1922.....		\$3,838,750
Value of irrigated crops per acre cropped.....		\$32.49
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$1,589,298.02	
Disbursements and liabilities.....	1,385,265.87	
Unencumbered balance June 30, 1923.....		\$204,032.15
Fiscal year 1924, amount specified in appropriation act.....		1,310,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$1,233,778.73	\$12,239,239.57
Less—		
Funds advanced and unapplied credits.....	500.00	63,736.50
Water-right contracts—		
Project lands (132,250 acres).....	62,142.05	7,191,940.24
Warren Act lands (approximately 114,912 acres).....	53,300.00	2,457,282.00
Total.....	115,942.05	9,712,908.74
Balance.....	1,117,836.68	2,526,330.83

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923.
Net operation and maintenance cost.....	\$230,173.02	\$2,103,483.42	\$234,364.05	\$2,223,579.28
Less—				
Charges billed or contracted.....	252,979.19	2,131,650.89	265,917.99	2,204,765.88
Penalties.....	6,868.28	31,042.16	5,551.09	34,692.94
Discounts.....	1 6,237.07	1 25,942.68	1 3,410.35	1 28,025.28
Total.....	265,611.40	2,188,745.87	268,088.73	2,211,433.54
Balance.....	1 23,438.38	1 33,266.45	1 33,724.68	12,145.74

<sup>1</sup> Contra.

## Summary of data for Yakima project to end of fiscal year 1923—Continued.

	Reclamation fund.	Judgments Court of Claims.	Increase of composition (net).	Total.
<b>Investment:</b>				
Disbursements and net transfers.....	\$15,171,120.50	\$71,999.46	\$254,331.83	\$15,497,451.79
Less collections.....	6,018,561.23			6,018,561.23
Net investment June 30, 1923.....	9,152,559.27	71,999.46	254,331.83	9,478,890.56

## Status of current accounts receivable as of June 30, 1923.

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
<b>To return net construction cost:</b>						
Funds advanced and unapplied credits...	\$500.00	\$63,736.50	\$500.00	\$63,736.50		
Water-right charges...	382,998.40	3,285,300.25	335,919.84	3,075,731.13	\$28,715.95	\$180,853.17
<b>Total</b> .....	383,498.40	3,349,036.75	336,419.84	3,139,467.63	28,715.95	180,853.17
<b>Charges paid in advance</b> .....			198.06	3,391.54		
<b>To return net operation and maintenance cost:</b>						
Operation and maintenance charges project lands (approximately 132,250 acres).	239,900.49	2,095,617.38	226,876.72	1,948,630.52	29,070.62	117,916.24
Warren Act lands (approximately 114,912 acres).....	26,017.50	109,148.50	82,148.50	109,148.50		
<b>Total</b> .....	265,917.99	2,204,765.88	259,025.22	2,057,779.02	29,070.62	117,916.24
<b>Charges paid in advance</b> .....			28.40	169.79		
<b>Penalties and interest</b> .....			5,581.09	34,692.94		
<b>Revenues:</b>						
Rentals of irrigation water.....	4,151.29	140,588.96	4,277.38	139,974.13		614.83
Rentals of power and light.....		3,635.33		3,635.33		
Rentals of grazing and farming lands.....	1,741.73	21,280.04	1,729.73	21,084.74		245.30
<b>Total</b> .....	5,893.02	165,504.33	6,007.11	164,644.20		860.13
<b>Miscellaneous uncollected.</b>						1,194.72
<b>Other miscellaneous collections (reclamation fund).</b>			50,156.89	618,416.11		
<b>Grand total collections</b> .....			657,018.49	6,018,561.23		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 5.5 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 0.53 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

## STORAGE.

At the end of the fiscal year the construction of Tieton Dam was more than half completed. The work for the year was largely a continuation of the features previously started, namely, clearing and stripping the dam site, placing earth and rock embankment, excavating for the corewall and placing concrete, excavation for the spillway and for the gate chamber in the outlet tunnel.

The principal new work undertaken was the reservoir clearing which was carried on both by Government force and by small contractors. Seven hundred and thirty thousand cubic yards of earth embankment, 130,000 cubic yards of rock embankment, 165,000 cubic yards of spillway excavation, 8,100 cubic yards of concrete, and

1,075 acres of reservoir clearing were the principal results accomplished during the year.

*Operation of storage reservoirs.*—The storage reservoirs at Lakes Keechelus, Kachess, CleElum, and Bumping were operated continuously from July 1 to October 12, 414,802 acre-feet having been released for irrigation purposes, leaving only 44,504 acre-feet hold-over. The run-off of the Yakima River at Union Gap totaled 2,280,000 acre-feet, which, with the exception of 1915 and 1920, is the lowest of record.

#### SUNNYSIDE DIVISION.

A siphon and lateral system to water 1,600 acres under the Granger irrigation district was constructed during the latter half of the fiscal year. The main siphon, which is 33 inches inside diameter and about 14,000 feet long, is built of reinforced concrete lock-joint pipe, manufactured on the project, and extends from the Sunnyside main canal at Mile 23.10 to a point near the town of Granger. The siphon and lateral system include 15,860 feet of 33-inch pipe, maximum head 135 feet; 340 feet of 24-inch pipe; 1,000 feet of 18-inch pipe, maximum head 30 feet; 4.3 miles of earth laterals and 1.1 miles of lined laterals; and 2 miles of 6-inch, 8-inch, and 10-inch distribution pipe.

Operation of the Sunnyside Canal system continued from July 1 to October 31, 1922. A maximum diversion of 1,300 second-feet was maintained from July 6 to August 2. The irrigation season of 1923 began on April 1.

Maintenance work consisted chiefly of removal of silt, moss, and weeds, and miscellaneous repairs to canals and structures. Exceptional items were the side lining with gravel of about 2 miles of the main canal and 1½ miles of branch canals, construction of two concrete chute drops on Snipes laterals 10.21 and 10.61, and the painting of several large wooden siphons. One hundred concrete and 97 wooden structures were built.

#### *Operation data, Sunnyside division, Yakima project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which the bureau was prepared to supply water.....	97,285	98,537	100,130	100,733	101,509	101,339
Acreage irrigated.....	80,500	84,650	90,000	93,610	94,500	95,000
Number of farms irrigated.....	2,720	2,780	2,810	2,955	2,965	.....
Miles of canal operated.....	590	590	605	605	605	605
Water diverted (acre-feet).....	385,179	415,097	421,384	417,522	440,348	421,950
Water diverted to land (acre-feet).....	254,280	290,402	295,215	284,800	309,709	301,838
Per acre of land irrigated (acre-feet).....	3.159	3.430	3.270	3.040	3.28	3.18

#### *Settlement data, Sunnyside division, Yakima project.*

Item.	1918	1919	1920	1921	1922
Total number of farms on project.....	2,780	2,810	2,905	3,065	3,138
Population.....	8,744	9,477	10,929	12,080	12,332
Number of irrigated farms.....	2,780	2,810	2,905	3,065	3,138
Operated by owners or managers.....	1,983	2,009	2,272	2,322	2,375
Operated by tenants.....	797	801	633	743	763
Population.....	8,744	9,477	10,929	12,080	12,332
Number of towns.....	13	13	11	11	11
Population.....	5,975	7,650	6,941	6,941	7,250
Total population of towns and on farms.....	14,719	17,127	17,870	19,021	19,582
Number of public schools.....	37	37	40	41	41
Number of churches.....	30	30	30	30	30
Number of banks.....	10	13	12	13	12
Total capital stock.....	\$275,000	\$400,000	\$330,000	\$397,000	<sup>1</sup> \$400,000
Total amount of deposits.....	\$2,642,851	\$4,388,610	\$2,695,848	\$2,914,808	<sup>1</sup> \$3,000,000
Total number of depositors.....	7,936	11,182	11,556	11,643	<sup>1</sup> 12,000

<sup>1</sup> Estimated.

## TIETON DIVISION.

Diversion of water from the Tieton River continued from July 1 to October 3, 1922, the storage supply of Clear Creek Reservoir being exhausted on the latter date. The irrigation season of 1923 began on April 21.

Maintenance work included cleaning of weeds, willows, and silt from 335 miles of canals and laterals, comprising the entire distribution system down to each farm unit, as well as repair and replacement of measuring-box structures. Betterment work on the sublateral system involved the erection of 2,700 linear feet of wood-stave flume, installation of 4½ miles of pipe lines, and the placing of approximately 100 cubic yards of concrete in turnout and division structures.

*Operation data, Tieton division, Yakima project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	31,000	31,000	32,000	32,000	32,000	32,000
Acreage irrigated.....	25,400	26,400	27,000	28,000	28,500	28,700
Miles of canal operated.....	335	335	335	335	335	335
Water diverted (acre-feet).....	80,377	90,280	98,223	96,506	100,844	93,754
Water served to land (acre-feet).....	57,318	64,068	70,776	69,471	71,148	71,105
Per acre of land irrigated (acre-feet).....	2.26	2.43	2.62	2.47	2.50	2.48

*Settlement data, Tieton division, Yakima project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	1,400	1,400	1,480	1,480	1,480	1,480
Population.....	2,150	2,150	2,850	3,314	3,457	3,542
Number of irrigated farms.....	1,190	1,280	1,253	1,340	1,300	1,300
Operated by owners or managers.....	726	820	903	1,048	1,010	965
Operated by tenants.....	464	460	350	292	290	335
Population.....	2,150	2,150	2,850	3,314	3,457	3,542
Number of towns.....	7	8	8	8	8	8
Population.....	20,500	21,850	23,000	23,000	23,000	23,000
Total population of towns and on farms...	22,650	24,000	25,850	26,314	26,457	26,542
Number of public schools.....	10	10	10	10	10	10
Number of churches.....	3	3	3	3	4	4

## CROPS AND DEVELOPMENT.

The crop yield for the season of 1922 was, on the whole, satisfactory, but the returns were disappointing owing, in large measure to marketing conditions, and a number of the water users were unable to pay their water-right charges in December. However, at the close of the fiscal year 1923 a good showing had been made in collections and a feeling of optimism and hope for the future prevailed. One of the best cherry crops in a number of years had been harvested and sold at a profitable price, and prospects never were better for a bumper crop of apples and other fruit.

## WYOMING, RIVERTON PROJECT.

H. D. Comstock, project manager, Riverton, Wyo.

The Riverton project lies in Fremont County, Wyo., northeast of Wind River and west of the Big Horn River. Adjacent towns on the Chicago & North Western Railway are Riverton and Shoshoni with estimated populations of 2,000 and 500. The source of water supply is Wind River. The irrigation season is from May 1 to September 30. The average altitude is 5,200 feet; the average annual rainfall is about 8 inches; the average maximum temperature is about 95° F.; and the average minimum temperature—27° F. The soil is a heavy loam. The principal products are alfalfa, cereals, sugar beets, potatoes; and the principal markets, Omaha, Denver, and local. The estimated duty of water is 2 acre-feet per acre per annum at the farm.

The flood waters of Wind River, Bull Lake Creek, and Dinwoody Creek will be stored in Pilot Butte, Bull Lake, and Dinwoody Reservoirs. The waters of Wind River will be diverted into the Wyoming Canal, serving the entire project.

### SUMMARY OF DATA FOR RIVERTON PROJECT TO END OF FISCAL YEAR 1923.

<b>Areas:</b>		
Irrigable acreage when project is complete.....	100,000	
Public land withdrawn on June 30, 1923.....	69,000	
Indian land, June 30, 1923.....	1,000	
Private land, June 30, 1923.....	30,000	
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....	\$948,194.55	
Disbursements and liabilities.....	665,938.22	
Unencumbered balance June 30, 1923.....		\$282,256.33
Fiscal year 1924 amount specified in appropriation act.....		600,000.00

	Fiscal year 1923.	To June 30, 1923.
Irrigation works, net construction cost.....	\$425,820.45	\$1,060,228.09

	Reclamation fund.	Wind River Indian.	Increase of compensation (net).	Total.
<b>Investment,:</b>				
Disbursements and net transfers.....	\$936,972.87	\$360,161.69	\$34,562.45	\$1,331,697.01
Less collections.....	20,493.37	985.65		27,479.02
Net investment June 30, 1923.....	910,479.50	359,176.04	34,562.45	1,304,217.99

### Status of current accounts receivable as of June 30, 1923.

	Collected—Cash.		Un- collected, June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	
Miscellaneous uncollected.....			\$16,158.36
Other miscellaneous collections (reclamation fund).....	\$7,449.65	\$24,493.37	
Wind River Indian miscellaneous collections.....	.19	985.65	
Grand total collections.....	7,449.84	25,479.02	

## ACTIVITIES DURING FISCAL YEAR.

The Wind River diversion dam was completed in May, 1923, except the bridge and some work on the gates. The work during the year involved about 28,000 cubic yards of excavation and 8,500 cubic yards of backfill, the placing of 13,650 cubic yards of concrete, 50,000 cubic yards of embankment, 7,500 cubic yards of riprap, and 209,000 pounds of gates and machinery.

At the Pilot Butte Reservoir the excavation for the outlet was done by dragline, amounting to 63,000 cubic yards.

On the Wyoming Canal work was begun on the structures on the first 10 miles, including lining, and 1,900 cubic yards of concrete were placed.

*Settlement data, Riverton project.*

Item.	1919	1920	1921	1922
Number of towns.....	2	2	2	2
Population.....	2,500	2,500	<sup>1</sup> 2,500	<sup>1</sup> 2,500
Number of public schools.....	2	2	2	2
Number of churches.....	7	7	7	7
Number of banks.....	5	5	5	5
Total capital stock.....	\$110,000	\$135,000	\$135,000	\$135,000
Amount of deposits.....	\$1,200,000	\$1,500,000	<sup>1</sup> \$900,000	<sup>1</sup> \$1,000,000
Number of depositors.....	2,700	2,600	<sup>1</sup> 2,200	<sup>1</sup> 2,200

<sup>1</sup> Estimated.

## WYOMING, SHOSHONE PROJECT.

J. S. LONGWELL, project manager, Powell, Wyo.

The Shoshone project is located principally in Park and Big Horn Counties, Wyo., with a small area in Carbon County, Mont., and consists of the Garland, Frannie, Willwood, and Heart Mountain divisions. Irrigation works have been constructed which provide for the delivery of water to approximately 71,000 acres in the Garland and Frannie divisions, and work is under way to provide for the irrigation of some 17,600 acres in the Willwood division. Water is obtained for these lands from the Shoshone River and storage is provided in the Shoshone reservoir, created by the Shoshone Dam located 8 miles west of Cody, Wyo., to supplement direct flow rights from the river.

The irrigation plan contemplates three diversions from the river. The first diversion, that for the proposed Heart Mountain division, will be located at the Shoshone Dam. No work has been undertaken on this feature except the surveys and a short outlet tunnel at Shoshone Dam. The second diversion, which has been in operation since 1908, is located at the Corbett Dam on the Shoshone River 16 miles below the Shoshone Dam, for the irrigation of lands in the Garland and Frannie divisions. The third diversion is to be effected by the Willwood Dam on the same stream, 8 miles below the Corbett Dam. The dam has been practically completed and work is under way on the construction of the canals and laterals to provide water for the lands of the Willwood division on the south side of the Shoshone River.

The annual rainfall on the project lands averages 5.5 inches and the average elevation of these lands is about 4,500 feet above sea level. Temperature records over the period of record show a mean maximum of 98.1° F. and a mean minimum of -19.7° F. The principal agricultural products on the developed part of the project are alfalfa, wheat, oats, potatoes, and sugar beets. On the Garland and Frannie divisions the amount of water delivered to the farms has averaged 2.29 acre-feet per acre irrigated. Transportation facilities are provided by the Chicago, Burlington & Quincy Railroad, and the principal markets are Billings and Butte, Mont.; Casper, Wyo.; Omaha, Nebr.; and Kansas City, Mo. The principal project towns are Powell, Deaver, and Frannie, Wyo.

### SUMMARY OF DATA FOR SHOSHONE PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....	139,000
Public land entered to June 30, 1923.....	63,265
Public land open to entry on June 30, 1923.....	1,816
Public land withdrawn on June 30, 1923.....	60,573
State land unsold on June 30, 1923.....	5,399
Railroad land unsold on June 30, 1923.....	987
Other private land, June 30, 1923.....	6,960
Acreage bureau could supply, season of 1922.....	71,223
Acreage irrigated, season of 1922.....	42,870
Acreage cropped under irrigation, season of 1922.....	41,907
Value of irrigated crops, season of 1922.....	\$788,125
Value of irrigated crops per acre cropped.....	\$18.81

#### Finances:

##### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$1,023,767.63
Disbursements and liabilities.....	923,005.79
Unencumbered balance June 30, 1923.....	\$100,761.84
Fiscal year 1924, amount specified in appropriation act.....	925,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$811,155.85	\$8,291,013.17
<b>Less—</b>		
Funds advanced and unapplied credits.....		1,000.00
Water-right contracts, project lands (66,005.73 acres).....	691,335.37	5,590,539.43
<b>Total.....</b>	<b>691,335.37</b>	<b>5,591,539.43</b>
<b>Balance.....</b>	<b>119,820.48</b>	<b>2,699,473.74</b>

*Summary of data for Shoshone project to end of fiscal year 1923—Continued.*

	Calendar year 1922.	To Dec. 31, 1922.	Fiscal year 1923.	To June 30, 1923
Net operation and maintenance cost.....	\$58,431.13	\$586,357.43	\$58,835.72	\$616,200.16
Less:				
Charges billed or contracted.....	73,544.72	609,507.67	72,290.93	608,112.93
Penalties.....	2,442.19	7,440.56	3,018.11	8,862.54
Discounts.....	1,799.23	19,785.74	1,509.50	19,865.56
Total.....	74,187.68	607,162.49	74,799.54	607,109.91
Balance.....	115,756.55	120,805.06	115,963.82	9,090.25
	Reclamation fund.	Judgments Court of Claims.	Increase of compensa- tion (net).	Total.
Investment:				
Disbursements and net transfers.....	\$9,016,606.06	\$322,164.67	\$146,839.24	\$9,485,609.97
Less collections.....	1,271,764.92			1,271,764.92
Net investment, June 30, 1923.....	7,744,841.14	322,164.67	146,839.24	8,213,845.05

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To return net construction cost:						
Funds advanced and un-						
applied credits.....		\$1,000.00		\$1,000.00		
Water-right charges.....	\$116,358.22	801,203.36	\$27,573.40	609,898.05	\$518.67	\$190,786.64
Total.....	116,358.22	802,203.36	27,573.40	610,898.05	518.67	190,786.64
Charges paid in advance.....			200.35	191.78		
To return net operation and maintenance cost:						
Operation and mainte-						
nance charges, project						
lands (66,005.73 acres)....	72,290.93	606,112.93	23,913.68	405,060.65	14,648.86	188,403.42
Charges paid in advance.....			71.56	268.57	3.83	
Penalties and interest.....			1,201.11	7,045.54	1,817.00	
Revenues:						
Rentals of irrigation water.....	847.28	12,366.05	1,063.31	12,113.90		252.15
Rentals of power and light.....	5,710.01	6,522.71	5,531.10	6,025.20		497.51
Rentals of grazing and farming lands.....	1,198.02	8,468.34	1,142.27	8,107.34		361.00
Total.....	7,755.31	27,357.10	7,736.68	26,246.44		1,110.66
Miscellaneous uncollected.....						10,056.34
Other miscellaneous collections (Reclamation fund).....			19,714.53	222,063.89		
Grand total collections.....			80,010.66	1,271,764.92		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 23.7 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1923, 30.9 per cent of total accruals.



## ACTIVITIES DURING FISCAL YEAR.

*Power system.*—The construction of the Shoshone power plant at the Shoshone dam was completed during the fore part of the year and a 36-inch balanced needle valve was installed at the lower end of the by-pass pipe discharging into the river below the power plant. This valve is used for the control of the reservoir discharge at all times when the river flow is less than 400 second-feet.

*Willwood division.*—The Willwood diversion dam had been practically completed and the first mile of the Willwood Canal, which is in heavy rock excavation, was under construction during the year. A 150-foot span steel bridge across the Shoshone River south of the town of Powell to give access to the irrigable land of this division was constructed in cooperation with Park County.

*Garland division.*—Drainage construction under supplemental agreements was carried on during the entire year of 1922 with three drag-line excavators and during 1923 with the same drag-line equipment and one trenching machine additional. Work during 1923 was done with funds from a supplemental construction charge of \$11 per acre announced by public notice of April 28, 1923. There were 14.8 miles of open drains and 3.25 miles of closed drains constructed.

*Frannie division.*—Drainage work was also carried on in this division under a supplemental construction agreement. Four drag-line excavators were employed, constructing 30.02 miles of open drains. Two thousand eight hundred twenty-eight linear feet of the Deaver Canal were lined with gunite to prevent seepage.

*Operation data, Shoshone project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau is prepared to furnish water.....	43,265	55,296	56,119	65,890	65,826	71,223
Acreage irrigated.....	32,984	38,282	41,641	45,650	46,420	42,870
Miles of canal operated.....	286	381	415	458	400	457
Water diverted (acre-feet).....	128,629	162,463	199,061	187,329	221,419	192,851
Water delivered to land (acre-feet).....	68,730	84,378	117,459	118,065	112,324	99,710
Per acre of land irrigated (acre-feet).....	2.10	2.29	2.81	2.50	2.47	2.33

*Settlement data, Shoshone project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	646	830	823	1,009	1,005	1,063
Population.....	1,941	2,320	2,481	2,730	2,686	2,444
Number of irrigated farms.....	621	750	808	910	985	914
Operated by owners or managers.....	467	616	619	695	646	696
Operated by tenants.....	154	134	184	215	289	218
Population.....	1,941	2,320	2,481	2,730	2,686	2,444
Number of towns.....	4	5	5	5	5	5
Population.....	1,082	1,170	1,395	1,345	1,541	1,585
Total population on farms and in towns...	3,023	3,490	3,876	4,075	4,227	4,029
Number of public schools.....	8	10	11	12	7	7
Number of churches.....	7	8	8	8	8	8
Number of banks.....	3	5	5	6	5	4
Total capital stock.....	\$60,000	\$75,000	\$110,000	\$125,000	\$110,000	\$100,000
Amount of deposits.....	\$488,000	\$654,000	\$656,000	\$644,000	\$543,000	\$441,000
Number of depositors.....	1,500	1,875	2,500	2,605	2,400	2,406

## SECONDARY PROJECTS.

### COOPERATIVE INVESTIGATIONS AND PROPOSED PROJECT EXTENSIONS.

NOTE.—A description of secondary projects and investigations carried on under cooperative contracts will be found in previous annual reports with complete references on pages 393 to 453 of the twentieth, and pages 119 to 133 of the twenty-first annual reports. The following discussions are limited to these projects and investigations on which work was done during the fiscal year ending June 30, 1923.

#### ARIZONA.

##### BOULDER CANYON RESERVOIR INVESTIGATIONS.

Field surveys and office studies for comparisons of various dam sites under investigation were continued. A geological examination of the reservoir and dam sites below the Virgin River was made by Dr. F. L. Ransome, of the Geological Survey, who reported favorably in all instances. Capt. H. A. C. Jenison, of the Geological Survey, partially completed a valuation survey of mineral deposits in the reservoir site. Investigations were made of construction materials in the vicinity of the dam sites.

A river gaging station was established and has been maintained on the Colorado River in Boulder Canyon since January 1.

Field surveys and diamond-drill investigations were completed. At the upper dam site in Boulder Canyon the maximum depth to bedrock varies from 90 feet below water surface under the upstream toe of the proposed dam to 158 feet under the downstream toe. The rock is quartz diorite and a fine grained granite, both of excellent quality, although considerably jointed. At the lower site in Black Canyon the corresponding depths are from 110 feet to 130 feet. The rock is of volcanic origin, excellent in quality and termed andesite tuff buccia by Doctor Ransome. A hole drilled into the foundation rock to a depth of 557 feet below low-water surface did not penetrate other formation. The investigations indicate that Black Canyon is the more favorable location for the dam, although a reservoir with dam in either canyon is feasible.

##### COLORADO RIVER DIVERSIONS.

Investigations were in progress to determine the feasibility of irrigating certain lands in Arizona from the Colorado River and to ascertain to what extent this might be economically done. This work was carried on by the State under supervision of a commission composed of Mr. E. C. LaRue, representing the Geological Survey; Mr. H. E. Turner, representing the State of Arizona; and Mr. Porter J. Preston, representing the Bureau of Reclamation. Available funds would permit only a general reconnaissance. Surveys were commenced by

field party in September, 1922, and continued until May, 1923. These covered the investigation of possible diversions to lands lying along and adjacent to the Colorado River from Boulder Canyon south. Investigations were also carried on to ascertain if it was feasible to divert above Boulder Canyon, carry the water by tunnel and canal through certain mountain passes, and place it upon large areas of land lying further back from the river.

Surveys were made to ascertain the elevation of certain controlling passes. A portion of the territory covered is at some distance from that covered by any former surveys, and it was therefore necessary to run long lines in order to obtain definite elevations at many of the controlling points. The lands possible of reclamation were viewed and a rough reconnaissance made of a large territory, embracing lands both north and south of the Gila River and as far south as the Mexican boundary.

#### COLORADO RIVER TRIBUTARIES.

An examination of storage possibilities on the Little Colorado River for lands near Winslow, Ariz., on the Virgin River for lands near Littlefield, Ariz., and on the Bill Williams River has been in progress since March, 1923. No development of any considerable size is possible without extensive storage and all available sites are expensive and complicated by the heavy silt burden of the flood flow of the streams from which the reservoirs can be filled. Thorough search of all drainage basins was made for suitable reservoir sites.

#### CALIFORNIA.

##### IMPERIAL VALLEY PROJECT.

(See also Arizona, Boulder Canyon investigations.)

The Colorado River Commission, after holding hearings in all States affected, formulated the Colorado River pact at Santa Fe, N. Mex., in November, 1922, which has since been ratified by all States in the Colorado River Basin except Arizona. In general, this pact formally allocates the waters of the Colorado River Basin between the upper and lower States.

##### SHASTA VALLEY PROJECT.

The investigation of this project under the cooperative agreement was completed and the report dated April, 1923, approved on May 21, 1923. An area of about 22,800 acres is irrigated in Shasta Valley at the present time. Additional areas of irrigable land in the valley that could be reached by diversion from Klamath River near Keno, Oreg., are estimated at 65,000 acres. The land is nearly all in private ownership and about 38 per cent is in cultivation by dry farming. The irrigation plan is so inseparably involved with power development that the cost for irrigation alone can not be estimated on present information. Any diversion of water for irrigation would result in reduced power possibilities from water of Klamath River between Keno and Willow Creek, and also would involve power rights of the California-Oregon Power Co., both at their existing plants and in

relation to their prospective developments. Whether the irrigation project is feasible will depend upon the terms of such an agreement as can be reached with the power company, since without large financial credits from power developed along the irrigation canals the project is too costly to be feasible at present.

#### STONY GORGE EXTENSION OF THE ORLAND PROJECT.

*Millsite division.*—Investigations regarding development of the Millsite Reservoir site to 120,500 acre-feet capacity for the purpose of insuring the Orland project against a serious water shortage during extreme drought seasons were concluded during the year. These consist of completion of diamond drilling, water-supply study, and preparation of report dated November, 1922.

The water-supply study embodied in a special report dated February, 1923, but not formally approved, states that an extension of 19,500 acres to the present project area, resulting in an enlarged project of 40,000 acres, is the most feasible plan for insuring the additional water supply. The shareholders of the Orland Unit Water Users' Association, however, at the annual meeting held in February, 1923, declined to accept the necessary increased charge, which is estimated at \$67.50 per acre in addition to the present building charge of \$55.

The study also indicates that whereas the water supply of Millsite Reservoir as applied to a separate division of 25,000 acres is sufficient to meet the irrigation requirements in most of the 21 years included in the study, it would be grossly deficient during the several drought years of record.

#### COLORADO.

##### ORCHARD MESA PROJECT.

This area has been combined with that of the Grand Valley project and arrangement perfected for delivery of water from the project main canal, in connection with which a concrete siphon was constructed across the Colorado River and reconstruction of canals and structures begun. This will be reported hereafter as part of the Grand Valley project.

#### IDAHO.

##### BOISE PROJECT EXTENSION, BLACK CANYON DIVISION.

The Black Canyon division comprises an area of 56,000 acres, exclusive of lands watered by the Notus Canal. This extension is located between the Boise and the Payette Rivers in Canyon and Gem Counties, Idaho. Under date of November 8, 1921, a contract was executed by the United States and the Emmett irrigation district, which irrigates lands in Payette Valley, providing for the construction of a diversion dam at Black Rock Canyon. It is planned for this dam to divert on both sides of the Payette River. On the north side water will be pumped by direct-connected pumps to supply the present canal of the Emmett irrigation district. The canal on the south side will be supplied by gravity. Water may be diverted on the south side to supply the Black Canyon lands of 56,000 acres. In July, 1922, work preparatory to construction of the

dam was begun, which consisted of the completion of a wagon road, the building of a power line, the erection of a construction camp, and the building of a railroad siding with warehouses. No surveys were made or other investigation carried on in connection with the irrigable area or water supply of the Black Canyon lands during the year. The dam on the Payette River is under construction for the Emmett irrigation district and will be reported hereafter as part of the Boise project.

#### DUBOIS PROJECT.

In connection with this investigation a survey run from the Egin Dam on the North Fork of the Snake River at St. Anthony, west to the proposed irrigable area, confirmed the fact that a large area of land could be reached by a diversion from this point, though the canal, on account of its flat grade through lava fields, would be rather expensive. Another survey from the Consolidated feeder heading just below Heise on the South Fork of Snake River to the Egin Dam at St. Anthony on the North Fork developed the fact that water from the South Fork, including Jackson Lake storage, could be utilized on the Dubois tract in addition to that available from the North Fork.

To reduce the cost of the main canal by increasing the velocity and decreasing the section, surveys were made for a canal system on a steep grade through the lava fields to the irrigable area, including a 6-mile tunnel under Big Bend Ridge connecting the proposed Island Park Reservoir, where the storage of the North Fork water would be possible.

Water-supply studies upon which the area of the project is to be based are being made in conjunction with studies of the entire Snake River drainage area. The indications are that the irrigable area of the project will be found to be nearer 150,000 than 350,000 acres, as was originally claimed. Through the failure of the finance association to advance the amount of funds agreed upon, the work was discontinued prior to completion.

#### MOUNTAIN HOME PROJECT.

Under contract with the Boise Chamber of Commerce dated May 12, 1921, detailed topography was taken along 20 miles of the roughest portion of the country to be crossed by the main canal from the Snake River, this section being between Black Canyon north of Gooding and Little Canyon Creek north of Glenns Ferry. Paper locations of canal and structures were then made and another fly line run from a point near the abandoned Jerome Reservoir to Black Canyon to connect the 1918 survey with what appeared to be the best location through the most difficult country. Preliminary designs and estimates have been made of some of the most important structures, and water-supply studies are being made to determine the amount of water that may be made available from Snake River. Although these studies are not complete, the indications are that there will be an insufficient water supply to irrigate all the available land, and it will probably be necessary to investigate an additional source of supply from the Salmon, Payette, and Boise Rivers before determining upon the feasibility of this project.

**AMERICAN FALLS RESERVOIR.**

A number of the present canal systems under private and district management requiring storage to complete their irrigation supply have completed plans for cooperation in the construction of this reservoir. Advance payments have been made by two irrigation districts and three others, one of which embraces five old canal companies irrigating some 400,000 acres have signed agreements. Contract was made with the Idaho Power Co. which eliminates the conflicting rights of this company at American Falls.

A large investment has been made in real estate required for flowage, including the greater portion of the old town of American Falls.

A new townsite has been laid out on higher ground for future development.

This will be reported hereafter as part of the Minidoka project.

**NEBRASKA.****LOWER PLATTE PROJECT.**

The investigations on the Lower Platte project, under cooperative contract with the Lower Platte Irrigation Association, were carried to completion and report issued dated February, 1923. This project contemplates the diversion of water from the Platte River, with storage in several inland reservoirs, for the irrigation of lands in private holdings in Lincoln, Dawson, and Buffalo Counties, embracing a total acreage of 297,000 acres under proposed canals and supplying storage water for 120,000 acres additional under private canals.

The report outlines eight schemes of development from the smallest practical unit to an ultimate complete development, with varying estimated costs per acre. Drainage investigations were carried on, borings being made over the low-lying lands, below present operated private canals. The results of this work show that approximately 35,000 acres of land are in need of drainage relief.

A review of the report was made by a board of engineers and submitted under date of March 9, 1923.

**TRI-COUNTY PROJECT.**

The Tri-County project is located in the south-central part of Nebraska, on the level table-lands between the Platte and Republican Rivers, in the counties of Gasper, Phelps, Kearney, and Adams.

The area of the project, as tentatively outlined for investigation, embraces 500,000 acres. The area which ultimately will be recommended for the project will depend on the available amount of water that can be secured from the Platte River and the required duty of water being experimentally determined by the Department of Agriculture.

Senate Joint Resolution 215, passed in September, 1922, authorized the Secretary of the Interior to make an investigation of this project upon advance of the necessary funds by the Central Nebraska Supplemental Water Association. The association accordingly advanced \$5,000 and by cooperation with the State of Nebraska \$2,000 additional was secured for this work.

Field work was commenced in November, 1922, with three location parties, and continued until the 1st of February. Main canals with an aggregate length of 225 miles were surveyed and 19,420 acres of detail topography taken at the proposed storage sites in the Plum Creek Basin and along the supply canal. Two reservoir sites were surveyed, having an aggregate storage capacity of 504,000 acre-feet.

From funds also advanced by the association, the United States Department of Agriculture, assisted by the agricultural department of the University of Nebraska, is engaged in making investigations and experiments to determine the water-holding capacity of the subsoil to decide the feasibility of subsoil storage and the amount of water that will have to be thus applied to supplement the deficiency in rainfall.

#### NEVADA.

##### COLORADO RIVER TRIBUTARIES.

An examination of three tributaries of the Colorado River—the Virgin in Utah, Arizona, and Nevada, and the Williams and Little Colorado in Arizona—to determine the possibility of further irrigation on these streams, was begun in March, 1923.

No development is possible without storage and storage is complicated by the heavy silt burden of the streams. Thorough search of the drainage basins was made for possible reservoir sites.

Twelve years' records on the Virgin indicate a dependable unused supply for storage of over 100,000 acre-feet. Storage sites are all of limited capacity and steep gradient. The climate is fine and portions of the available land are highly productive and would bear comparatively heavy construction charges.

Surveys are being made to determine the probable cost of storage and distribution.

#### NEW MEXICO.

##### CARLSBAD EXTENSION-PECOS RIVER INVESTIGATIONS.

Final report was completed by N. H. Darton, of the Geological Survey, on the No. 3 dam and reservoir site with respect to foundation for the dam and the probability of leakage within permissible limits. Soil surveys were concluded by A. T. Strahorn, of the Bureau of Soils, on the Carlsbad extensions and the Fort Sumner areas. The lands south of the present project were found to be largely of inferior character owing mostly to the presence of gypsum. Lands to the west of the present project were found to contain a net area of 22,000 acres of irrigable land of good character. Final report on the investigations was rendered in May, 1923, and approved. In view of the conflicting opinions regarding the water-retentive qualities of the No. 3 reservoir site, and the experience gained at the McMillan and Hondo sites, the water-supply and cost estimates are based on the utilization of the safer Alamogordo site. For a total irrigated area of 57,000 acres, consisting of 25,000 acres of Carlsbad project lands, 10,000 acres of Fort Sumner project lands, and 22,000 acres of new lands west of the present Carlsbad project, the required capacity of the Alamogordo Reservoir was determined to be 135,000

acre-feet with the canal systems at Carlsbad extensively lined. For these new lands a canal would divert from Pecos River  $1\frac{1}{2}$  miles below McMillan Reservoir, parallel the present main canal on an 85-foot higher elevation, and end at Black River. This canal would be very costly owing to difficult location, a large percentage of classified material, a tunnel 2,300 feet long and numerous siphons or flumes. Alternative diversion at the No. 3 dam site was found even more expensive.

#### MIDDLE RIO GRANDE PROJECT.

Investigation of this project was completed and the report dated March, 1923, was approved on April 13, 1923.

The report submits plans and estimates of cost of canal systems, drainage and river bank protection, and for storage. This storage must be provided to regulate the annual flow as needed, to hold over from high to low years for the use of the middle valley project, and to make up the loss to Elephant Butte reservoir which might otherwise occasionally occur, owing to the operation of this project. Two reservoir sites were studied in this connection, one being on the Rio Grande a few miles north of the Colorado-New Mexico State line and the other on the Chama River in New Mexico.

#### PENASCO RIVER INVESTIGATIONS.

Irrigation has been carried on in the vicinity of Hope, N. Mex., for about 25 years, by diverting the normal flow of the Penasco River continuously throughout the year. The lands are very productive, commercial orchards giving very profitable yields where the water supply is sufficient for irrigation.

In the second annual report of the Bureau of Reclamation are found a map and a description of preliminary surveys of four reservoir sites made in 1903 on Eagle Draw and Penasco River, all of which were considered infeasible. Early in 1923 an allotment of \$5,000 was made by the Secretary of the Interior for further investigations of this project. Since April a reconnaissance has been made from Dayton, N. Mex., to Trails End, a distance of 80 miles. Topography has also been taken on two newly discovered prospective reservoir sites. Automatic gages have been maintained at both sites, but so far the run-off has been insufficient to make flood storage dependable for any increase in irrigated area. At one of these sites, however, it may be found feasible to store the winter run-off for use during the dry months of May and June, which will give a more reliable water supply for lands now under cultivation. Investigations are still in progress.

#### OREGON.

##### BAKER PROJECT.

Under date of April, 1922, a formal report on surveys and estimates of the Baker project was issued as a result of the previous season's investigations. In this report two possible dam sites for Thief Valley Reservoir are proposed, site No. 1, at the lower end of Thief Valley, providing a capacity of 130,000 acre-feet, and site No. 2,



3 miles further down the canyon, providing a capacity of 146,000 acre-feet. Site No. 2 is preferred in this report and testing the foundation is recommended. A project of 30,000 acres of new lands and 7,500 acres of supplemental supply lands is proposed.

Under date of July 3, 1922, a board report was issued reviewing the report of April, 1922. In this report it was recommended that tests of dam site No. 2 and more detailed surveys and estimates of the north and south canals and the lateral system be made; and also that negotiations be begun with the Oregon-Washington Railroad & Navigation Co. and the State highway commission for the removal of their roads from the reservoir site.

In August, 1922, a geological report on the two dam sites was written by Mr. A. C. Spencer of the Geological Survey, in which he recommended both sites as feasible.

The work recommended in the board report of July 3, 1922, was carried out during the summer and fall of 1922. The testing of dam site No. 2 by diamond drill and tunneling was completed in November, and under date of November 18, 1922, a board report was written in which it was recommended that dam site No. 2 be abandoned on account of unfavorable foundation conditions, and that testing of site No. 1 be undertaken; also that on account of the elimination of nonirrigable lands the project be reduced to 24,000 acres needing full supply, 2,000 acres needing partial storage and full canal capacity, and 4000 acres needing partial storage and no canal capacity. Dam site No. 1 was accordingly tested by diamond drill and test pits, with especially favorable results, the greatest depth to bedrock being 10 feet below low-water surface and the rock being very hard and tight. This drilling was completed in January, 1923.

Under date of January 20, 1923, a board report was issued based upon further investigation and estimates. In this report it was concluded that the net acreage of the project should be as recommended in the board report of November 18, 1922 (see above); that the required available reservoir capacity is 95,000 acre-feet; that dam site No. 1 should be adopted (required depth of water at dam, 115 feet); that the main canal (length  $9\frac{1}{2}$  miles) should head in the storage dam. It is recommended by the board that the project be given favorable consideration on the following conditions; (a) That satisfactory contract be secured for repayment of the cost; (b) that the railroad relocation be made without cost to the project; (c) that settlement with the old Carey Act company be made as estimated in the report; (d) and that the reservoir right of way be secured within the appraisal.

An agreement was secured from the State highway commission to remove the highway from the reservoir site without cost to the project (estimated cost \$25,000); and a verbal agreement was secured from the president of the Union Pacific Railroad Co. to pay one-half of the cost of removing the railroad from the reservoir site (total estimated cost \$420,000).

The investigation of the Baker project was completed in May, 1923, and the equipment and organization were transferred to other projects.

**M'KAY STORAGE, UMATILLA PROJECT EXTENSION.**

The construction of the McKay Reservoir to furnish supplemental water for 30,000 acres of land to the south of the present Umatilla project was approved and contracts are now pending with the Westland and Stanfield irrigation districts for repayment of the cost.

On account of exorbitant prices asked for lands required for the dam construction the work was delayed pending outcome of three suits in condemnation required to secure possession of these lands. Favorable results were attained and possession was expected early in July.

The reservoir is located on McKay Creek, about 8 miles south of Pendleton, Oreg.

This will be reported hereafter as part of the Umatilla project.

**MALHEUR PROJECT.**

The Warmsprings irrigation district has constructed an irrigation system from the Malheur River covering about 32,000 acres near Vale, Malheur County. The Warmsprings storage reservoir, located 60 miles above Vale, on the Malheur River, has a capacity of 170,000 acre-feet, about one-half of which is surplus. Under date of August 26, 1922, a contract was entered into with the Warmsprings irrigation district and the State of Oregon providing that the United States should investigate possible extensions at a cost not to exceed \$10,000. During the fall of 1922 surveys were made of canal location covering tracts of land on both sides of the river, the line on the north side extending to Dead Ox Flat. The point of diversion from the river was taken 1 mile west of Namorf Station, which permits covering the flat in the vicinity of Harper. The total length of canal line run was 104 miles. The gross area covered by this survey amounted to 86,000 acres. Studies were made of the results of this work, together with that of previous years, including the water supply of the drainage area. A preliminary report was submitted under date of January, 1923. In May, 1923, a soil survey was begun under direction of the Department of Agriculture covering the various tracts under this investigation.

**OREGON-CALIFORNIA.****KLAMATH PROJECT, PUMPING DIVISION.**

The lands included in the Pumping division have a total area of about 20,000 acres. There are 14 separate areas adjacent to project canals varying in size from about 200 to 4,000 acres. The proposed lifts are from 25 to 70 feet. All the lands are in private ownership. During the past year the Malin irrigation district, the Shasta View irrigation district, and the Sunnyside irrigation district executed contracts with the United States for a water supply. The area pledged by the three contracts is about 9,000 acres. Pumping and distribution works are to be constructed by the districts.

**KLAMATH PROJECT, LOWER KLAMATH LAKE DIVISION.**

There are about 76,000 acres gross of marsh lands in this division, 27,000 acres being in Oregon within the boundaries of the Klamath

drainage district and 49,000 acres being in California. The Klamath drainage district has contracted for a water right from the United States and is proceeding to construct its own drainage and irrigation system. The ownership of a large portion of the marsh lands in California is in doubt. The area involved is claimed by both the State and the United States. It will take court action to determine the ownership.

#### LANGELL VALLEY PROJECT.

A canal and distribution system for lands in the Langell Valley and Horsefly irrigation districts, on the west side of Lost Creek, have been under construction during the year. These lands will secure their water supply from Clear Lake Reservoir, already constructed, in connection with the Klamath project.

The district is also negotiating a contract for the construction of the Gerber, heretofore known as the Horsefly Reservoir, on Miller Creek, and a distribution system for some 8,600 acres on the east side of Lost River. Investigations on these features, completed during the year, show favorable results.

These operations will hereafter be reported as part of the Klamath project.

#### OREGON-WASHINGTON.

#### UMATILLA RAPIDS PROJECT.

For the investigation of the Umatilla Rapids project, the second session of the Sixty-seventh Congress appropriated a special fund of \$50,000. The work proposed will consist of the investigation of possible power development at the Umatilla Rapids on the Columbia River and the uses to which the power developed can be put. Preliminary investigations indicate the possibility of developing about 125,000 horsepower during the entire year, which can be put to commercial uses, and the additional development of about 250,000 horsepower during the summer season, which can be utilized for pumping irrigation water on lands in Oregon and Washington.

At the close of the fiscal year the work performed consisted of office studies and the topographic mapping of the marginal lands adjacent to the dam site and back-water pool.

#### TEXAS.

#### LOWER RIO GRANDE PROJECT.

The preliminary examination of flood conditions in Hidalgo, Cameron, and Willacy Counties, Tex., initiated by the contract of November 29, 1920, between the Bureau of Reclamation and the Rio Grande Valley Chamber of Commerce, was completed early in 1923, under contracts with the associated water improvement districts of Cameron and Hidalgo Counties and the Lower Rio Grande Water Users' Association dated June 24 and August 15, 1922, respectively.

The report of this investigation gives accounts of past floods, with a discussion of the probable losses that would have resulted from them if all the valley had been in cultivation, and a tentative plan for flood control, estimates of cost, and the value of the benefits to

be expected from the construction of protection works. Numerous maps, photographs, and other exhibits are included in the report.

On account of the limited capacity of the river channel and the fact that the Rio Grande is an international stream, most of the flood flow must be diverted from the river at the upper end of the valley without building any dams or other regulating works that will conflict with present treaty provisions.

Briefly, the scheme outlined contemplates taking a maximum of 130,000 second-feet into a wide floodway formed by levees extending from the head of Sardinias Resaca to the marsh lands bordering Laguna Madre, a distance of some 75 miles. At the lower end of Llano Grande Lake, 34 miles from the intake, provision is made for diverting the flow in excess of 100,000 second-feet from the floodway into Arroyo Colorado.

To provide against overflows from the river, a dike some distance from, and, in a general way, paralleling the Rio Grande, is to be built from the head of the main floodway to Brownsville.

As near as can be determined at this time, the net area to be protected is approximately 340,800 acres. Work was completed and the field office at McAllen, Tex., was closed on April 5, 1923.

#### RED BLUFF RESERVOIR.

Drilling at the dam site indicated the presence of gypsum in large quantities at shallow depths. Numerous outcrops of gypsum have been noted in the reservoir site, those along Delaware River being the most massive. Large sink holes exist in the upper part of the reservoir site. Indications point to the probable existence of large and continuous beds of gypsum and cavernous limestone which would carry water around the dam site if a storage reservoir were constructed. A final report by the Geological Survey awaits funds for additional work needed for its completion.

#### UTAH.

##### SALT LAKE BASIN INVESTIGATIONS.

The investigations were continued during the fiscal year. On September 1, 1922, a supplemental contract was entered into between the United States and the State of Utah providing additional funds and extending the scope of the work. The Weber River division report was completed in December, 1922. On March 31, 1923, a board of engineers consisting of the assistant chief engineer and the designing engineer of the bureau and the State engineer of Utah met at Salt Lake City and recommended that additional work be done to ascertain the possibility of using Bear River water on part of the area now tributary to the Weber River. This work is in progress.

In May, 1923, the Utah Lake division report was completed. On June 4, 1923, a board of engineers reviewed this report and suggested that additional information be obtained as to agricultural possibilities of the areas located west of Salt Lake City and south of Provo, Utah. The balance of the investigation, with the exception of the Tooele Valley, was given favorable recommendation for early construction, when the landowners to be benefited have completed arrangements for repayment of cost.

The field investigations have covered the area in the Salt Lake Basin from the Tooele Valley to the north line of Weber County. The same will be extended to cover the area adjacent to the Bear River below Collinston, Utah, and lands in Cache Valley irrigated by tributaries of the Bear River. The Magpie dam site on the Ogden River and the Chalk Creek dam site on the stream of that name will be tested by drilling, preliminary to early construction if the land-owners to be benefited agree to repayment of the cost as required by the reclamation act.

#### SPANISH FORK-LEHI DRAINAGE INVESTIGATIONS.

One hundred observation holes were bored along the eastern shore of Utah Lake in the vicinities of Lehi, American Fork, Spanish Fork, and Lake Shore for studying and investigating the ground-water conditions therein and for determining the boundaries of lands needing drainage and those affected by the fluctuations of the surface of Utah Lake.

#### INTERMOUNTAIN DIVERSIONS FROM THE COLORADO RIVER BASIN.

An examination into the water supply and construction features where it is possible to divert water for irrigation from Colorado River Basin into Salt Lake Basin was in progress.

A preliminary study of the water supply of the following six possible projects which had been suggested by local interests was completed on May 18, and field investigation of each was begun.

Middle and Black Forks of Green River to Bear River.

North Fork of Duchesne River and West Fork of Rock Creek to Provo River.

Upper Price River (Fish Creek) to San Pitch River.

Headwaters of Cottonwood and Ferron Creeks (San Rafael Basin) to San Pitch River.

Fish Lake to Otter Creek in Sevier River Basin.

Duck Lake to Asay Creek or Coal Creek in Sevier River Basin.

The Reconnaissance of the Duck Lake and Fish Lake projects was completed on June 15, and reports were submitted June 27.

It is found that all the water of Duck Lake can be diverted to either Asay Creek or Coal Creek, both in the Sevier River Basin or to the Virgin River Basin. Satisfactory information as to the water supply is, however, not available.

Any surplus of water over irrigation demands in Fremont Basin can be diverted from Fish Lake and Seven Mile Creek into Otter Creek, a tributary of Sevier River, for use on undeveloped lands in Grass Valley, near the town of Koosharem. There is at present insufficient information as to the amount of this surplus water, but it is estimated to be between 5,000 and 10,000 acre-feet. It is estimated that 10,000 acre feet could, if available, be diverted at a cost of \$20 to \$30 per acre foot.

#### CASTLE PEAK PROJECT.

Runoff records for securing water supply data were continued.

#### LOWER WHITE RIVER INVESTIGATIONS.

This project would irrigate lands in Colorado as well as Utah. The contract dated September 1, 1922, between the United States

and the State of Utah provided for a cooperative investigation of the Lower White River project located between the Yampa and White Rivers. A field party determined the irrigable acreage and "backed" a canal location from the governing elevation of the area to an intersection with the White River, near Meeker, Colo. This possible canal location traverses some very rough mountainous land requiring a large amount of tunnelling and concrete bench fluming. A preliminary report on the possibility of irrigation from the White River, completed in May, 1923, shows that the cost would be very high and the project infeasible under present conditions. The investigation is being continued to ascertain if a project water supply could be secured more economically by diversion from the Yampa River at the Juniper Canyon dam site.

#### PRICE RIVER PROJECT.

All work on this project was postponed pending the success of a proposed bond sale by an irrigation district at Price, Utah, which if successful would result in the construction of the reservoir on Fish Creek, requiring the larger part of the available water supply. The irrigable area in this valley is largely in excess of the area possible to irrigate with the water supply available, even if storage is provided for all the flood flow.

#### WASHINGTON.

##### COLUMBIA BASIN PROJECT.

This project was surveyed by the State of Washington in 1919 and 1920. The irrigable area as found by the State survey is 1,753,000 acres and the cost of the project was estimated at \$300,475,678. The land lies in central Washington east of the Columbia River. Further investigations were provided for by acts of Congress of February 21 and March 4, 1923, making a special appropriation of \$100,000 for this purpose. An office was established at Spokane, Wash., and men were assigned to this work from the Bureau of Reclamation, the Geological Survey, and the Bureau of Soils. At the end of the fiscal year field work was in progress on soil surveys, geological examinations, test borings, and other surveys. A progress report is to be made in December, 1923, and the complete report in 1924.

##### COLUMBIA RIVER POWER INVESTIGATIONS.

A study of the Columbia River from Flathead Lake to Pasco, Wash., was commenced in the fall of 1921, by a board consisting of Col. J. B. Cavanaugh, United States Army; D. C. Henny, consulting engineer, Bureau of Reclamation; and F. F. Henshaw, district engineer, Geological Survey, Portland, Oreg., representing departments of the Federal Government; and C. S. Heidel, State engineer of Montana; W. G. Swendsen, State commissioner of reclamation for Idaho; and Marvin Chase, supervisor of hydraulics for the State of Washington, representing the three States affected. The object was to formulate plans for power development best adapted to a comprehensive scheme of improvement and utilization.

The study was completed on June 30, 1922, when a report was rendered to the Federal Power Commission, which was published with letter of transmittal of O. C. Merrill, executive secretary, dated February 17, 1923. The report was signed by all members of the board, with the exception of Marvin Chase, who presented a minority report. The conclusions of the majority report favor fullest irrigation development in the three States concerned, refer to the Columbia Basin Project as the most important single future user of Columbia River water, and recommend dedication of Flathead Lake to the use of Montana power under certain restrictions, and Pend Oreille and Priest Lakes to the Columbia Basin project if supplied by gravity, and to power in Washington if the basin project is supplied by pumping.

The majority report further shows that at known dam sites between Flathead Lake and Pasco the all-year effective horsepower which can be developed with Columbia Basin project supplied by gravity is 1,796,000, and with the project supplied by pumping 2,443,000, the latter additional to the seasonal power required for irrigation pumping.

#### YAKIMA PROJECT EXTENSIONS.

Proposed extensions to the Yakima project include four divisions, as follows, on which surveys and estimates have been made:

*Roza division.*—A board of engineers, consisting of J. L. Savage, James Munn, F. T. Crowe, and J. L. Lytel, reviewed the plans and estimates for the Roza division, their conclusions being contained in board report of October 6, 1922. The plans and estimates for the irrigation of 58,350 acres were approved on November 10, 1922.

*Kittitas division.*—Plans and estimates for the irrigation of 70,000 acres in the Kittitas division were made by an engineer employed by the district. His report of June 1, 1922, was forwarded to the chief engineer, through the Yakima project office, on September 16, 1922. A board of engineers, consisting of James Munn, J. L. Savage, and J. L. Lytel, went over the proposed works on the ground on October 8 and 9, 1922, and concluded that the hydraulic features and important structures should be carefully checked by the Bureau of Reclamation before final decision could be given on the report of the district. During the winter of 1922-23 the district engineer prepared construction plans and specifications with a view to proceeding with construction through the sale of district bonds. The district was, however, unsuccessful in its attempt to dispose of the bonds on account of a slump in the bond market.

*Kennewick division.*—The Kennewick irrigation district (Kennewick division) purchased a considerable portion of the right of way required for the main power canal, and acquired rights and property at Prosser Dam, through condemnation suit. Court decree in this suit was dated September 18, 1922. The irrigable area is 35,000 acres.

*Moxee division.*—Surveys were completed for the irrigation of 36,750 acres and the report dated June 29, 1921, was approved on January 11, 1922.

All these divisions have made provision for the necessary water supply for irrigation through Warren Act contracts with the United States, but the cost of reclamation in each case is higher than heretofore considered feasible.

## WYOMING.

## ALCOVA-CASPER PROJECT.

A soil survey and irrigable area classification was completed by Mr. A. T. Strahorn, of the Department of Agriculture, during the past year and the report, which was issued in the fall of 1922, shows the tract to contain large areas of land which, on account of adverse soil, drainage, or topographic conditions, were unsuitable for irrigation; and of the 88,742 acres designated as possible to irrigate, only 52,363 acres were found to be first class and 36,379 acres were shown as second class.

The estimated costs as given in the report of February, 1922, were based on an assumed irrigable area of 100,000 acres; and the results of the soil survey which decrease the available irrigable area quite materially, increase the estimated per acre cost and make the project's feasibility even more questionable.

*Financial data for secondary project investigations.*

## BAKER.

Appropriations:	
Fiscal year 1923, amount of congressional authorizations.....	\$363,541.37
Disbursements and liabilities.....	49,263.72
Unencumbered balance June 30, 1923.....	314,287.65
Fiscal year 1924, amount specified in appropriation act.....	None.

## OTHERS.

Appropriations:	
Fiscal year 1923, amount of congressional authorizations.....	\$329,010.48
Disbursements and liabilities.....	223,632.09
Unencumbered balance June 30, 1923.....	105,378.39
Fiscal year 1924, amount specified in appropriation act.....	200,000.00

	Baker. <sup>1</sup>		Deschutes.		Other investigations. <sup>2</sup>		Total.	
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.
Net cost of investigations.....	\$36,750.07	\$63,439.09	\$25.43	\$8,360.96	\$210,638.73	\$1,940,156.78	\$247,363.37	\$2,001,956.83
Less funds advanced.....	\$10,000.00	5,000.00	.....	.....	67,356.37	458,491.99	57,356.37	463,491.99
Balance.....	46,750.07	48,439.09	\$25.43	8,360.96	143,282.36	1,481,664.79	190,007.00	1,538,464.84
Investment to date:								
Reclamation fund—								
Disbursements and net transfers.....		49,043.02		894.85		1,910,377.75		1,960,315.62
Less collections.....		675.74		.15		574,352.75		575,028.64
Net investment.....		48,367.28		894.70		1,336,025.00		1,385,286.98
Increase of compensation (net).....		1,356.95		43.01		33,926.80		35,326.76
Investment, all funds.....		49,724.23		937.71		1,369,951.80		1,420,613.74

<sup>1</sup> Previously included with "Other investigations."<sup>2</sup> Includes Imperial Valley.<sup>3</sup> Contra.



*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected.
	Fiscal year 1923.	To June 30, 1923.	Cash.		Other credits to June 30, 1923.	
			Fiscal year 1923.	To June 30, 1923.		
To apply on net cost of investigations:						
Funds advanced—						
Baker.....	\$10,000.00	\$5,000.00	.....	\$5,000.00	.....	.....
Other secondary investigations.....	67,356.37	458,491.99	\$57,970.58	425,147.70	.....	\$33,344.29
Revenues:						
Rentals of grazing and farming lands—						
Deschutes.....		7,407.29	.....		\$7,407.29	.....
Other secondary investigations.....	12,728.05	146,614.88	11,923.23	110,065.77	35,090.38	1,458.73
Other collections:						
Baker.....			675.74	675.74		
Deschutes.....				.15		
Other secondary investigations.....			17,827.03	34,139.28		299.25
Grand total collections.....			88,396.58	575,028.64		

*Statement showing costs of secondary project investigations and funds contributed for these investigations.*

Features.	Cost, fiscal year 1923.	Total to June 30, 1923.	Contributed funds.
Arizona:			
Arizona well drilling.....	1 \$466.70	\$3,069.63	\$1,446.01
Arizona cooperative.....	1 1.50	20,285.17	13,714.42
Colorado River diversions.....	1,723.43	1,723.43	
Parker.....		517.91	
San Carlos distribution.....		8,638.54	8,638.54
Little Colorado.....		9,554.33	
San Carlos.....		24,829.51	
San Pedro.....		2,427.34	
Paradise Verde.....		929.14	929.14
Total Arizona.....	1,255.23	71,985.00	24,728.11
Arizona-California:			
Boulder Canyon Reservoir.....	124,249.26	252,161.45	141,000.00
Colorado River Basin.....		164,320.85	
Colorado River (prior to July 1, 1914).....		43,710.00	
Less Ferry Reservoir.....	1,825.49	1,825.49	
Total Arizona-California.....	126,074.75	462,017.79	141,000.00
California:			
Shasta Valley.....	17,010.09	36,619.14	23,587.23
Imperial Valley (cooperative).....	1 1,740.80	39,014.49	26,009.66
Imperial Valley.....		2,794.04	
Owens Valley (cooperative).....		18,232.01	18,232.01
Owens Valley (old ledger).....		12,061.92	
Imperial Laguna.....		1,543.81	1,543.81
Iron Canyon.....		36,806.00	18,550.73
Jess Valley.....		3,805.74	1,901.01
Kings River storage.....		1,157.70	
Lassen County.....		2,445.60	1,222.80
Furlock-Modesto.....		278.97	
Oakdale So. San Joaquin.....		1,079.16	
Putah Creek.....		211.32	
Pitt River cooperative.....		2,499.18	
Sacramento Valley.....		43,620.72	
San Joaquin.....		3,531.20	
San Luis Rey.....		698.53	
San Ysidro.....		7.50	
Shasta County cooperative.....		5,645.75	2,297.38
Warners Ranch Reservoir.....		5,378.35	5,378.35
Woodbridge.....		180.47	
Total California.....	15,269.29	217,641.60	107,721.03

1 Contra.

Statement showing costs of secondary project investigations and funds contributed for these investigations—Continued.

Features.	Cost, fiscal year 1923.	Total to June 30, 1923.	Contrib- uted funds.
<b>Colorado:</b>			
Dolores.....		\$4,256.27	
White River.....		4,357.00	
Little Snake River.....		951.43	
Montezuma.....		4,918.10	
San Luis Valley.....		4,318.01	
Total Colorado.....		18,800.81	
Colorado-Utah: Lower White River.....	\$10,738.31	11,340.83	\$7,000.00
<b>Idaho:</b>			
Mountain Home (cooperative).....	2,442.23	15,334.25	9,000.00
Mountain Home.....		5,978.57	
Dubois (cooperative).....	7,834.87	7,834.87	3,689.00
Dubois.....		17,252.06	
Black Canyon <sup>1</sup> .....	15,123.67		
Idaho investigations.....		1,327.25	
Island Park.....		4,774.53	
Swan Valley.....		544.88	
Port Neuf.....		2,168.01	
General investigations.....		1,191.78	
Weiser River storage.....		918.96	
Wood River.....		168.95	
Succor Creek.....		2,392.67	
Total Idaho.....	14,846.57	59,886.78	12,689.00
<b>Montana:</b>			
Camas.....	100.65	100.65	100.00
Clarks Fork (old ledger).....		5,581.23	
Clarks Fork.....		3,666.95	
Crow Reservation.....		18,911.96	
Judith Basin.....		2,891.42	2,891.42
Lake Basin.....		7,103.26	
Bitter Root.....		2,719.64	
Madison River.....		10,729.09	
Marias.....		13,546.39	
Missoula-Huson.....		3,086.33	
Toston, vicinity of.....		544.58	
Kalispell.....		73.29	73.29
Tally Lake.....		2,544.21	2,544.21
Cut Bank.....		1,863.01	1,863.01
Total Montana.....	100.65	73,362.01	7,471.93
<b>Montana-North Dakota: Surveys.....</b>		9,296.90	
<b>Nebraska:</b>			
Tri-County.....	5,000.00	8,381.70	5,000.00
Lower Platte.....	4,709.87	23,844.61	15,400.00
South Platte.....		2,877.01	
Total Nebraska.....	9,709.87	35,103.32	20,400.00
<b>Nevada:</b>			
Humbolt River.....		722.55	
Walker River.....		13,696.37	
Upper Owyhee.....		292.08	292.08
Total Nevada.....		14,711.00	292.08
<b>New Mexico:</b>			
Pecos Valley.....	1,749.42	11,617.82	5,700.00
Middle Rio Grande.....	3,794.93	9,896.52	6,500.00
Penasco.....	2,661.55	2,661.55	
La Platta.....		28,064.33	
Las Vegas.....		5,014.09	
Upton Lake.....		17,464.70	
Total New Mexico.....	8,205.90	74,719.01	12,200.00
<b>North Dakota:</b>			
Bismark.....		13,621.69	
Bowman.....		4,025.03	
Little Missouri.....		11,933.52	
Washburn.....		10,532.73	
Nesson.....		17,471.83	
Total North Dakota.....		57,584.80	

<sup>1</sup> Contra.<sup>2</sup> Transferred to Boise project.

Statement showing costs of secondary project investigations and funds contributed for these investigations—Continued.

Features.	Cost, fiscal year 1923.	Total to June 30, 1923.	Contrib- uted funds.
<b>Oklahoma:</b>			
Lawton.....		\$13,774.82	
Turkey Creek.....		137.30	
Cimarron.....		8,801.17	
Oklahoma reconnaissance.....		400.00	
Red River.....		60,209.27	
Total Oklahoma.....		83,412.56	
<b>Oregon:</b>			
Malheur (cooperative).....	\$4,221.78	4,221.78	\$5,000.00
Malheur.....		88,472.72	14,724.61
Baker.....	36,750.07	53,439.09	5,000.00
Central Oregon.....		39,128.82	
Columbia River (cooperative).....		17,008.51	
John Day.....		16,009.57	
Deschutes.....		22,883.15	17,888.88
Do.....	125.43	5,360.98	
Harney.....		1,046.62	
Klamath River investigations.....		347.89	
Ochoco.....		3,570.30	4,307.00
Owyhee (Oregon cooperative).....		1,615.74	
Owyhee (Oregon secondary).....		1,267.29	
Owyhee (contract).....		8,709.22	4,354.61
Rogue River.....		1,426.96	942.07
Silver Creek.....		334.23	
Silver Lake.....		3,407.03	775.91
Warner Valley.....		1,181.85	
White River.....		97.08	
Willamette Valley.....		378.20	
Teel District.....		456.35	
General investigations.....		226.43	
Total Oregon.....	40,946.42	273,599.24	53,001.17
<b>South Dakota: Angostura.....</b>		6,874.31	3,542.61
<b>Texas:</b>			
Lower Rio Grande (flood control)—			
Water Users' Association.....	2,304.71	12,543.12	12,543.12
Associated improvement district.....	5,506.79	5,506.79	5,506.79
Lower Rio Grande (irrigation).....		32,598.81	15,394.44
Lower Rio Grande (irrigation district).....		558.49	558.49
Cotulla.....		110.00	
Red Bluff Reservoir.....	4,600.83	5,425.68	5,500.00
Pecos River surveys.....		7,120.71	
Total Texas.....	12,412.33	63,863.60	29,502.84
<b>Utah:</b>			
Castle Peak.....	78.50	24,794.13	999.45
Salt Lake Basin.....	20,685.18	31,053.02	25,500.00
Price River investigations.....	127.67	127.67	
Price River.....		17.73	
Cache Valley.....		334.26	5,000.00
Transmountain diversions.....	1,571.35	1,571.35	
Spanish Fork-Lehi drainage.....	100.91	100.91	
Dixie Reservoir.....		863.52	
Utah reconnaissance.....		632.59	
Mammoth Reservoir.....		404.27	
Green River (cooperative).....		10,494.18	5,247.00
Green River water-right investigations.....		252.74	
Bear Lake.....		18,827.72	
Provo-Weber.....		141.85	
Utah Lake.....		34,049.30	
Juab investigations.....		4,196.68	4,196.68
Total Utah.....	22,907.87	127,861.42	40,943.22
<b>Washington:</b>			
Benton.....		11,167.45	
Columbia River Basin investigations.....	165.98	5,687.02	
Columbia River power.....	427.51	4,042.95	
Kittitas.....		19,366.90	
Lower Snake River-Pasco.....		2,090.49	
Methow-Okanogan.....		192.14	
Palouse.....		76,409.01	
Palouse cooperative.....		10,201.92	

<sup>1</sup>Contra.

Statement showing costs of secondary project investigations and funds contributed for these investigations—Continued.

Features.	Cost, fiscal year 1923.	Total to June 30, 1923.	Contrib- uted. funds.
<b>Washington—Continued.</b>			
Wapato.....		\$36,465.77	
Priest Rapids.....		6,216.01	
Snake and Columbia Rivers investigations.....		82.81	
<b>Total Washington.....</b>	<b>\$261.58</b>	<b>171,981.47</b>	
<b>Wyoming:</b>			
Saratoga-Encampment.....	71.47	4,883.61	
Alcova-Casper.....	571.81	4,809.77	
Pathfinder pumping.....		1,568.96	
Church Butte.....		1,442.28	
De Smet.....		8,917.38	
Fifteen Mile.....		125.06	
Green River.....		320.15	
Lyman.....		2,477.77	
North Platte cooperative.....		5,868.66	
Wyoming cooperative.....		3,681.76	
General investigations.....		2,073.34	
<b>Total Wyoming.....</b>	<b>643.28</b>	<b>36,168.74</b>	
<b>Miscellaneous:</b>			
General reconnaissance.....		6,182.31	
Miscellaneous investigations.....	56.16	8,924.19	
Preliminary investigations.....		80,488.73	
Experimental investigations.....	3,628.35	6,200.41	
<b>Total miscellaneous.....</b>	<b>3,684.51</b>	<b>101,795.64</b>	
<b>Grand total secondary projects.....</b>	<b>247,363.37</b>	<b>2,001,956.83</b>	<b>*\$463,491.99</b>

\* Of the contributed funds, \$33,344.29 is uncollected.

## INDIAN IRRIGATION PROJECTS.

(These projects are being built under a cooperative working agreement between the Bureau of Reclamation and the Office of Indian Affairs, whereby the Bureau of Reclamation forces have charge of the work on the ground and report to the Commissioner of the Bureau of Reclamation who advises the Commissioner of Indian Affairs of details. The Indian Service sets the general policy to be followed and determines the rate of progress through the medium of the estimates for the annual appropriations in the Indian appropriation bill.)

### MONTANA, BLACKFEET (INDIAN) PROJECT.

R. M. SNELL, project manager, Browning, Mont.

The Blackfeet project is located in Glacier and Pondera Counties, and is served by the Great Northern Railway. The source of water supply is Two Medicine River and Cut Bank, Badger, Birch, Whitetail, and Blacktail Creeks. Project towns are Browning, Blackfoot, Cut Bank, and Valier. Rainfall averages about 12 inches and the temperature ranges from an average low of about—35° F. to an average high of about 90° F. The average elevation of the irrigable area is about 3,850 feet above sea level; the soil is principally a rich sandy loam with some gravelly loam and gumbo. The principal products are hay, grain, and vegetables and the principal markets are Great Northern Railway towns from St. Paul to the Pacific coast. The irrigation plan provides for the diversion of water from several streams through six canal systems and for the use of four reservoirs, two of which are now constructed to part capacity.

### SUMMARY OF DATA FOR BLACKFEET (INDIAN) PROJECT TO END OF FISCAL YEAR 1923.

<b>Area and crops:</b>		
Irrigable acreage when project is complete.....		107,500
Indian land, June 30, 1923 (acres).....		107,500
Acreage bureau could supply, season of 1922.....		20,900
Acreage irrigated, season of 1922.....		8,652
Acreage cropped under irrigation, season of 1922.....		8,425
Acreage dry-farmed, season of 1922.....		8,893
Value of irrigated crops, season of 1922.....		\$136,514
Value of irrigated crops per acre cropped.....		\$16.20
Value of dry-farmed crops, season of 1922.....		\$104,526
Value of dry-farmed crops per acre cropped.....		\$11.75
<b>Finances:</b>		
Appropriations—		
Fiscal year 1923, amount of congressional authorizations.....		\$44,629.52
Disbursements and liabilities.....		44,629.52
Fiscal year 1924, amount specified in appropriation act.....		60,000.00

	Fiscal year 1923.	To June 30, 1923.
<b>Irrigation works:</b>		
Net construction cost.....	\$32,482.31	\$1,176,842.91
Less water-right contracts <sup>1</sup> .....	9,922.85	23,595.70
Balance.....	22,559.46	1,153,247.21

	Indian funds.	Judgments Court of Claims.	Increase of compensation (net.)	Total.
<b>Investments:</b>				
Disbursements.....	\$1,248,760.37	\$29.91	\$14,227.21	\$1,263,017.49
Less collections.....	52,858.32			52,858.32
Net investment June 30, 1923.....	1,195,902.05	29.91	14,227.21	1,210,159.17

<sup>1</sup> Nominal construction assessment pending completion of project and determination of total charge per acre.

*Status of current accounts receivable, as of June 30, 1923.*

	Due.		Collected.		Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	
To return net construction cost:					
Water-right charges.....	\$9,922.85	\$23,585.70	\$1,469.40	\$3,590.40	\$20,005.30
Charges paid in advance.....			32.47	32.47	
Revenues, rentals of irrigating water.....	9,700.44	41,660.33	12,153.88	44,910.27	7,750.06
Miscellaneous uncollected.....					83.89
Other miscellaneous collections.....			250.83	15,325.18	
Grand total collections.....			13,906.06	52,858.32	

Uncollected construction water right charges as of June 30, 1923, 86 per cent of total accruals.

Uncollected operation and maintenance charges (water rentals) as of June 30, 1923, 18 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

*Badger-Fisher division.*—Minor timber structures were placed on the lateral system. About 2 miles of Four Horns Reservoir outlet canal were excavated and two concrete drops and four minor timber structures were placed.

*Operation and maintenance.*—The Two Medicine, Badger-Fisher, Piegan, and Birch Creek divisions were operated during the season of 1922. Water was delivered on a water-rental basis. On account of comparatively heavy precipitation during the growing season the amount of water delivered was only about 26 per cent of that delivered during the 1921 season. A total of 8,652 acres were irrigated, 1,031 of which were irrigated by Indians or for Indian families.

*Operation data, Blackfeet project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which the bureau was prepared to furnish water.....	21,500	21,500	21,500	21,500	<sup>1</sup> 20,900	<sup>1</sup> 20,900
Acreage irrigated.....	2,448	3,484	9,767	9,937	14,650	8,652
Miles of canal operated.....	125	152	199	192	255	221
Water diverted (acre-feet).....	21,284	22,324	38,319	22,133	45,282	17,553
Water delivered to land (acre-feet).....	2,663	6,205	14,000	8,955	19,674	5,067
Per acre of land irrigated (acre-feet).....	1.08	1.83	1.43	.90	1.34	.59

<sup>1</sup> The 20,900 acres reported here is the amount that can be supplied through canals now constructed. The decrease from the amount given in 1920 is due to reclassification of some of the lands. Lateral systems are complete except for minor structures and lateral extensions to reach 43,240 acres.

*Settlement data, Blackfeet project.*

Item.	1916	1917	1918	1919	1920	1921	1922
Total number of farms on project.....	3,000	3,000	3,000	2,900	2,900	2,900	2,900
Number of irrigated farms.....	79	91	125	329	351	497	322
Operated by owners or managers.....	79	84	76	95	151	172	110
Operated by tenants.....		7	49	234	251	325	212
Population.....	170	180	229	299	319	435	317
Number of towns.....	4	4	4	4	4	4	4
Population.....	1,750	1,900	2,000	3,350	3,000	2,725	3,550
Total population in towns and on farms	1,920	2,070	2,229	3,649	3,319	3,160	3,867
Number of schools.....	5	3	4	6	6	7	8
Number of churches.....	8	8	8	8	8	8	8
Number of banks.....	3	4	4	6	5	4	2
Capital stock.....					\$130,000	\$120,000	\$56,000
Deposits.....					\$851,600	\$603,000	\$397,600
Depositors.....					2,257	1,790	1,150

## MONTANA, FLATHEAD (INDIAN) PROJECT.

C. J. MOODY, project manager, St. Ignatius, Mont.

The Flathead project is located in western Montana in Flathead, Missoula, and Sanders Counties, on the Northern Pacific Railway. There are 15 towns on the project with a total population of 5,500. The source of water supply is from about 70 creeks flowing from the mountains that surround the irrigable lands. The elevation of the irrigable area is 3,000 feet above sea level. The range of temperature is from an average maximum of 96° F. to an average minimum of -21° F. The character of the soil on the Jocko division is a gravelly loam; on the Camas and Mission Valley divisions, clay and sandy loam. The irrigation season is from May 1 to October 15, 168 days. Duty of water in acre-feet per annum is 2.75 on the Jocko division and 1.5 on the Camas and Mission Valley divisions. The principal products are hay, grain, vegetables, and fruit. The principal markets are Butte and Missoula, Mont.; Spokane, Wash.; and local mining towns and lumber camps.

The Jocko division includes about 12,000 acres irrigated by direct diversion from the Jocko River, and tributaries without storage. The Camas division includes about 10,500 acres of land lying along the west side of the Little Bitterroot River, which is the water supply. Storage is obtained in Little Bitterroot Lake, where a reservoir of 18,000 acre-feet has been constructed; at the Hubbard Reservoir site, with a capacity of 12,000 acre-feet, now being constructed; and at Dry Fork Reservoir, proposed capacity 3,400 acre-feet, which has been constructed to 2,000 acre-feet capacity. The Mission Valley division consists of about 102,000 acres, for which the water supply comes from creeks rising in the Mission Mountains, supplemented by the surplus waters of the Jocko River. Ten reservoirs are proposed with a total capacity of 105,000 acre-feet of which five are constructed to part capacity with 38,000 acre-feet now available for storage. A feed canal 45 miles in length along the foot of the Mission Mountains has been constructed to collect the water from the several streams. Another feed canal is in course of construction to take surplus waters from the Jocko River 10 miles to Tabor Reservoir.

### SUMMARY OF DATA FOR FLATHEAD (INDIAN) PROJECT TO END OF FISCAL YEAR 1923.

#### Areas and crops:

Irrigable acreage when project is complete.....		124,500
Public land entered to June 30, 1923.....	43,008	
State land unsold on June 30, 1923.....	862	
Indian land, June 30, 1923.....	33,225	
Private land, June 30, 1923.....	47,405	
Acreage bureau could supply, season of 1922.....		106,920
Acreage irrigated, season of 1922.....		30,356
Acreage cropped under irrigation, season of 1922.....		28,769
Value of irrigated crops, season of 1922.....		\$522,680
Value of irrigated crops per acre cropped.....		\$18.05

#### Finances:

##### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$233,609.17	
Disbursements and liabilities.....	231,052.69	
Unencumbered balance June 30, 1923.....		\$2,546.48
Fiscal year 1924, amount specified in appropriation act.....		555,000.00

	Fiscal year 1923	To June 30, 1923
<b>Irrigation works:</b>		
Net construction cost.....	\$311,819.68	\$4,803,406.38
Less water-right contracts <sup>1</sup> .....	47,640.72	110,052.98
Balance.....	264,178.96	4,693,353.40

<sup>1</sup> Nominal construction assessment pending completion of project and determination of total charge per acre.

## Summary of data for Flathead (Indian) project to end of fiscal year 1923—Continued.

	Indian funds.	Increase of compensation (net).	Total.
<b>Investment:</b>			
Disbursements.....	\$5,029,402.91	\$145,104.27	\$5,174,507.18
Less collections.....	229,378.70		229,378.70
Net investment.....	4,800,024.21	145,104.27	4,945,128.48

## Status of current accounts receivable, as of June 30, 1923.

	Due.		Collected.		Uncollected June 30, 1923.
	Fiscal year 1923.	To June 30, 1923.	Fiscal year 1923.	To June 30, 1923.	
<b>To return net construction cost:</b>					
Water-right charges.....	\$47,640.72	\$110,052.98	\$11,891.23	\$25,542.30	\$84,510.68
Charges paid in advance.....			<sup>1</sup> 43.22		
<b>Revenues:</b>					
Rentals of irrigating water.....	39,417.13	206,464.11	31,272.97	149,130.87	57,333.24
Rentals of grazing and farming lands.....		5.00		5.00	
<b>Total.....</b>	<b>39,417.13</b>	<b>206,469.11</b>	<b>31,272.97</b>	<b>149,135.87</b>	<b>57,333.24</b>
Miscellaneous uncollected.....					52.31
Other miscellaneous collections.....			5,263.88	68,564.05	
<b>Grand total collections.....</b>			<b>46,626.86</b>	<b>229,378.70</b>	

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1923, 76.8 per cent of total accruals.

Uncollected water-rental charges as of June 30, 1923, 27.8 per cent of total accruals.

## ACTIVITIES DURING FISCAL YEAR.

*Camas division.*—Construction of a variable radius arch concrete dam at the Hubbart Reservoir, with an average height of about 100 feet, was begun. Stripping and excavation were completed and 25 per cent of the concrete was placed during the year. Extensions of lateral system were made to include 500 acres.

*Mission Valley division.*—Excavation of the Tabor feed canal was begun and completed to a point between Falls Creek and the North Fork of Jocko River. Enlargement of Ninepipe Dam was begun and the placing of embankment was 50 per cent completed. Enlargement of the Pablo feeder canal below Post Creek to a capacity of 400 second-feet was begun. Polson Lateral C, to irrigate 500 acres north of the Polson Hill, was constructed. Extensions of laterals near Round Butte were made to irrigate 400 acres, and a lock-joint pipe siphon 2,600 feet long with 21-inch and 18-inch diameter pipe was begun to supply these laterals.

*Jocko division.*—Construction of laterals diverting from Jocko River and Revais Creek to supply about 1,400 acres near Dixon was begun in the spring of 1923.

## CROPS AND DEVELOPMENT.

There was a large increase of alfalfa which amounted to 47 per cent of the total irrigated area. Alfalfa seed crops produced good values on the Camas division. There was a large increase in dairy



stock and a marked tendency toward diversified farming, resulting in a better financial condition among the water users. Dairy cattle were being obtained through local dairy loan associations and by the aid of local bankers and merchants. Crop conditions in the spring season of 1923 were very good on account of frequent heavy rains, and there was considerable immigration of farmers from dry-land sections wishing to lease irrigable land. Activity of local land companies has resulted in advertising the project in various sections of the United States. Prospects were favorable for an increase in the acreage farmed on the irrigable area.

*Operation data, Flathead project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water (storage incomplete).....	80,300	84,300	91,000	98,000	105,500	108,920
Acreage irrigated.....	15,863	27,128	34,453	32,836	30,486	30,356
Miles of canal operated.....	364	674	741	750	713	717
Water diverted (acre-feet).....	54,853	84,358	112,112	80,961	105,422	128,190
Water delivered to the land (acre-feet).....	21,691	34,696	50,607	40,958	47,445	40,380
Per acre of land irrigated (acre-feet).....	1.37	1.28	1.47	1.25	1.55	1.33

*Settlement data, Flathead project.*

Item.	1918	1919	1920	1921	1922
Total number of irrigable farms.....	2,630	2,630	2,000	2,030	2,034
Population.....	14,500	14,500	15,000	14,000	16,000
Number of irrigated farms.....	853	860	1,028	1,105	1,008
Operated by owners or managers.....	670	650	799	944	848
Operated by tenants.....	183	200	229	161	160
Population.....	1,679	1,700	2,380	2,302	2,094
Number of towns.....	14	14	14	15	15
Population.....	4,325	5,250	5,445	5,500	5,500
Total population in towns and farms.....	18,825	19,750	20,445	19,500	11,500
Number of public schools.....	60	55	45	45	40
Number of churches.....	15	16	19	19	19
Number of banks.....	11	11	11	11	11
Total capital stock.....	\$221,000	\$250,000	\$287,000	\$287,000	\$250,000
Amount of deposits.....	\$1,011,177	\$1,316,907	\$1,457,645	\$1,238,117	\$919,774
Number of depositors.....	4,384	4,656	4,447	4,301	4,048

<sup>1</sup> Estimated.

# MONTANA, FORT PECK (INDIAN) PROJECT.

E. L. DECKER, project manager, Poplar, Mont.

The Fort Peck project is located in Sheridan, Valley, and Roosevelt Counties in the northeastern part of Montana, and is comprised in a major portion of the Fort Peck Indian Reservation. The irrigation plan as outlined consists of five principal systems, as follows: Big Porcupine division, comprising about 4,000 acres, to be supplied with water from Big Porcupine Creek, the natural flow to be supplemented by storage; Little Porcupine division, of 2,000 acres, to be supplied by storage of the flood waters of Little Porcupine Creek; Poplar division, of about 30,000 acres, located in the Poplar River Valley, to be supplied from the natural flow of the Poplar River, supplemented by storage; Big Muddy division, of 16,000 acres, to be supplied by the natural flow of the Big Muddy, Smoke, and Wolf Creeks, supplemented by storage; and the Missouri River division, of 84,000 acres, to be supplied by a gravity canal from the Missouri River. It was also found possible to irrigate about 18,000 acres by pumping from the Missouri Canal with lifts of from 12 to 20 feet.

The irrigation season extends from May 1 to September 30, a total of 153 days. The average elevation of the project lands is 2,000 feet above sea level. The average annual precipitation is slightly over 13 inches, and the maximum range of temperature from -40° to 100° F. The soil is very fertile, varying from a heavy clay to a light sandy loam. Crops best suited to the project are hay, grains, potatoes, onions, truck, and sugar beets. The project is located along the main line of the Great Northern Railroad and is within range of good markets.

## SUMMARY OF DATA FOR FORT PECK (INDIAN) PROJECT TO END OF FISCAL YEAR 1923.

### Areas and crops:

Irrigable acreage when project is complete.....	153,394
Public land entered to June 30, 1923.....	9,713
Public land open to entry on June 30, 1923.....	107
Public land withdrawn on June 30, 1923.....	100
State land unsold on June 30, 1923.....	80
Indian land, June 30, 1923.....	133,394
Private land, June 30, 1923.....	10,000
Acreage bureau could supply, season of 1922.....	22,795
Acreage irrigated, season of 1922.....	611
Acreage cropped under irrigation, season of 1922.....	611
Acreage dry-farmed, season of 1922, about.....	2,000
Value of irrigated crops, season of 1922.....	\$0,403
Value of irrigated crops per acre cropped.....	\$15.72
Value of dry-farmed crops, season of 1922, about.....	\$10,000
Value of dry-farmed crops per acre cropped, about.....	\$5.00

### Finances:

#### Appropriations—

Fiscal year 1923, amount of congressional authorizations.....	\$20,666.92
Disbursements and liabilities.....	16,487.45
Unencumbered balance June 30, 1923.....	\$4,179.47
Fiscal year 1924, amount specified in appropriation act.....	30,000.00

	Fiscal year 1923.	To June 30, 1923.
Irrigation works:		
Net constructor cost.....	\$20,544.67	\$886,665.81
Less water-right contracts.....	8,373.05	16,633.70
Balance.....	12,171.62	870,032.11

Investment.	Indian funds.	Judgments, Court of Claims.	Increase of compensation (net).	Total.
Disbursements.....	\$906,963.52	\$168.34	\$17,245.28	\$924,377.14
Less collections.....	25,389.17			25,389.17
Net investment, June 30, 1923.....	881,574.35	168.34	17,245.28	898,987.97

NOTE.—Water-right contracts cover charge of 50 cents an acre on land irrigated for the year 1920 and 50 cents an acre on all land under ditches allotted or owned for 1921 and years thereafter.

*Status of current accounts receivable as of June 30, 1923.*

	Due.		Collected.			Uncollected June 30, 1923.
	Fiscal year 1923.	To date.	Cash.		Other credits, to date.	
			Fiscal year 1923.	To date.		
To return net construction cost: Water-right charges.....	\$8,373. 05	\$16,633. 70	\$253. 20	\$750. 44	.....	\$15,883. 26
Revenues:						
Rentals of irrigation water.....	627. 74	4,683. 41	265. 25	3,100. 40	\$208. 15	1,374. 86
Rentals of grazing and farming lands..	103. 93	509. 93	103. 93	509. 93	.....	.....
Total.....	731. 67	5,193. 34	369. 18	3,610. 33	208. 15	1,374. 86
Miscellaneous uncollected.....	.....	.....	.....	.....	.....	662. 00
Other miscellaneous collections.....	.....	.....	1,049. 92	21,028. 40	.....	.....
Grand total collections.....	.....	.....	1,672. 30	25,389. 17	.....	.....

Uncollected construction water right charges as of June 30, 1923, 95 per cent of total accruals.

Uncollected operation and maintenance (water rental) charges as of June 30, 1923, 29.3 per cent of total accruals.

**ACTIVITIES DURING FISCAL YEAR.**

Construction consisted of the excavation of 2 miles of lateral on the Big Porcupine division to irrigate about 300 acres of irrigable land, and the installation of minor structures in connection with operation.

Four divisions of the project were operated during 1922, the season extending from May 1 to September 30. Considerable difficulty has been experienced by the bureau in making use of lands and water now available. Chief among these is the fact that the major portion of the lands for which water has been supplied belongs to Indian allottees and is very poorly farmed. An earnest endeavor on the part of the bureau during the present season to induce more and better farming is meeting with success, over 150 acres of alfalfa having been seeded by Indians and whites. The irrigated acreage of 1922 will be more than doubled during the season of 1923.

Maintenance consisted of the repair to canal banks on the Big Porcupine and Poplar divisions where excessive spring floods did considerable damage. About 4 miles of canal and lateral were cleared of brush and water growth, minor structures were repaired, and in some cases replacements were made.

*Operation data, Fort Peck project, by calendar years.*

Item.	1917	1918	1919	1920	1921	1922
Acreage for which bureau was prepared to supply water.....	14,220	16,620	16,620	16,620	20,762	22,795
Acreage irrigated.....	1,602	1,299	1,047	1,568	1,021	611
Miles of canals operated.....	126	158	158	158	158	88
Water diverted (acre-feet).....	3,600	3,000	3,000	3,600	3,000	7,760
Water delivered to land (acre-feet).....	1,550	1,400	2,000	2,000	1,800	622
Per acre of land irrigated (acre-feet).....	1.2	1.08	1.9	1.3	1.8	1.02

*Settlement data, Fort Peck project.*

Item.	1917	1918	1919	1920	1921	1922
Total number of allotments on project (irrigable).....	1,780	1,780	1,780	1,780	1,780	1,780
Population (Indian).....	2,130	2,160	2,157	2,070	2,150	2,174
Number of irrigated farms.....	58	66	62	70	35	30
Operated by owners or managers.....	57	60	37	45	33	17
Operated by tenants.....	1	6	25	25	2	13
Population.....	134	130	110	150	150	68
Number of towns.....	5	5	5	5	5	5
Population (white).....	2,650	3,500	4,850	5,000	5,000	5,000
Total population in towns and on farms.....	2,784	3,630	4,960	5,150	7,150	7,174
Number of schools:..						
Indian.....	5	5	4	4	2	2
White.....	5	5	5	5	5	5
Number of churches.....	8	9	9	10	10	10
Number of banks.....	6	9	9	9	6	7
Total capital stock.....	\$130,000	\$185,000	\$225,000	\$225,000	\$145,000	\$170,000
Amount of deposits.....	\$580,000	\$1,095,000	\$1,555,000	\$1,700,000	\$1,150,000	\$1,150,000
Number of depositors.....	2,630	3,700	4,500	4,700	3,200	3,000

## APPENDIX.

### LEGISLATION.

#### ELECTRIC POWER ON SALT RIVER PROJECT.

AN ACT Authorizing the sale of surplus power developed under the Salt River reclamation project Arizona. (Act September 18, 1922, 42 Stat. 847.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That whenever a development of power is necessary for the irrigation of lands under the Salt River reclamation project, Arizona, or an opportunity is afforded for the development of power under said project, the Secretary of the Interior is authorized, giving preference to municipal purposes, to enter into contracts for a period not exceeding fifty years for the sale of any surplus power so developed, and the money derived from such sales shall be placed to the credit of said project for disposal as provided in the contract between the United States of America and the Salt River Valley Water Users' Association, approved September 6, 1917: *Provided,* That no contract shall be made for the sale of such surplus power which will impair the efficiency of said project: *Provided, however,* That no such contract shall be made without the approval of the legally organized water users' association or irrigation district which has contracted with the United States to repay the cost of said project: *Provided further,* That the charge for power may be readjusted at the end of five, ten, or twenty year periods after the beginning of any contract for the sale of power in a manner to be described in the contract.

#### IRRIGATION INVESTIGATION IN NEBRASKA.

JOINT RESOLUTION Providing for an additional investigation of the tricoounty irrigation project Nebraska. (Resolution of September 22, 1922, Pub. Res. No. 74, 42 Stat. 1067.)

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior, upon the payment to him in advance of the necessary funds to defray the expenses thereof, be, and he is hereby, authorized to make an additional investigation of the tricoounty project in Nebraska, comprising the counties of Gosper, Phelps, and Kearney, in said State, and to extend said investigation into Adams County, Nebraska, with a view of ascertaining whether it is practicable to convey for irrigation purposes flood waters from the Platte River onto lands in said counties.

#### APPROPRIATIONS FOR RECLAMATION SERVICE.

(Extract from) an act making appropriations for the Department of the Interior for the fiscal year ending June 30, 1924, and for other purposes. (Act January 24, 1923, Public No. 395, 42 Stat. 1174.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior for the fiscal year ending June 30, 1924, namely:

\* \* \* \* \*

#### RECLAMATION SERVICE.

The following sums are appropriated out of the special fund in the Treasury of the United States created by the act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

For all expenditures authorized by the act of June 17, 1902 (Thirty-second Statutes, page 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law and all other acts under which expenditures from said fund are authorized, including salaries in the District of Columbia and elsewhere; examination of estimates for appropriations in the field; refunds for overcollections hereafter received

on account of water-right charges, rentals, and deposits for other purposes; printing and binding, not exceeding \$30,000; law books, books of reference, periodicals, engineering and statistical publications, including their exchange, not exceeding \$1,500; purchase, maintenance, and operation of horse-drawn or motor-propelled passenger-carrying vehicles; payment of damages caused to the owners of lands or private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior; and payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior:

Salt River project, Arizona: For examination of project and project accounts, \$5,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, \$430,000;

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, \$50,000;

Grand Valley project, Colorado, including Orchard Mesa unit: For operation and maintenance, continuance of construction, and incidental operations, \$395,000;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, \$185,000;

Boise project, Idaho: For operation and maintenance, continuation of construction, and incidental operations: *Provided*, That the expenditure for drainage shall not exceed the amount paid by the water users pursuant to the provisions of the Boise public notice dated February 15, 1921, except for drainage in irrigation districts formed under State laws and upon the execution of agreements for the repayment to the United States of the costs thereof, \$1,390,000;

King Hill project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$35,000;

Minidoka project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, with authority in connection with the construction of American Falls Reservoir, to purchase or condemn and to improve suitable land for a new town site to replace the portion of the town of American Falls which will be flooded by the reservoir, and to provide for the removal of buildings to such new site and to plat and to provide for appraisal of lots in such new town site and to exchange and convey such lots in full or part payment for property to be flooded by the reservoir and to sell for not less than the appraised valuation any lots not used for such exchange, \$665,000;

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$115,000;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$140,000: *Provided*, That repayment of the construction cost of the project may be made through a division by the Secretary of the Interior of such cost into a primary construction charge and a supplemental construction charge, of approximate equality, the former payable according to section 2 and the latter payable according to section 4 of the extension act of August 13, 1914 (Thirty-eight Statutes at Large, page 686);

Sun River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$145,000;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$120,000;

North Platte project, Nebraska-Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$1,420,000;

Newlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, \$735,000;

Carlsbad project, New Mexico: For operation and maintenance, continuation of construction, and incidental operations, \$80,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, \$900,000;

North Dakota pumping project, North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$100,000;

Baker project, Oregon: For investigation, commencement of construction, and incidental operations, \$500,000;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, \$900,000;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, \$700,000;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$95,000;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, \$45,000;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$65,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$1,310,000;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$600,000;

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$925,000;

Secondary projects: For cooperative and miscellaneous investigations, \$100,000;

For the continued investigation of the feasibility of irrigation, water storage, and related problems on the Colorado River, and investigation of water sources of said river, \$100,000;

Under the provisions of this act no greater sum shall be expended nor shall the United States be obligated to expend, during the fiscal year 1924, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1924 exceed the whole amount in the "reclamation fund" for that fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions, an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1924, the Director of the Reclamation Service shall find that the expenses of travel can be reduced thereby, he may, in lieu of actual traveling expenses, under such regulations as he may prescribe, authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile, used for necessary travel on official business.

Total, Reclamation Service, \$12,250,000.

The aggregate of all estimates of appropriations from the "reclamation fund" contained in the Budget for any fiscal year shall be included in the totals of the Budget for that year.

### **RELIEF FOR INJURED RECLAMATION SERVICE EMPLOYEE.**

AN ACT For the relief of William B. Lancaster. (Act February 5, 1923, 42 Stat. 204.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Treasury be, and he is hereby, authorized and directed to pay, out of any money in the Treasury not otherwise appropriated, to William B. Lancaster, during his natural life, the sum of \$40 per month, to date from the passage of this act, as compensation for injuries sustained while employed by the Reclamation Service at the west portal, Strawberry Tunnel, Strawberry Valley project, Utah, said monthly payments to be paid through the United States Employees' Compensation Commission.

### **DRAINAGE ON THE NEWLANDS PROJECT.**

AN ACT Authorizing an appropriation to meet proportionate expenses of providing a drainage system for Piute Indian lands in the State of Nevada within the Newlands reclamation project of the Reclamation Service. (Act February 14, 1923, 42 Stat. 246.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there is hereby authorized to be appropriated out of any money in the Treasury not otherwise appropriated, the sum of \$41,077.05, payable in 20 annual installments of \$2,100 each, except the last, which shall be the amount remaining unpaid, for the purpose of meeting the proportionate expense of providing a drainage system for 4,047 acres of Piute Indian lands in the State of Nevada within the Newlands project of the Reclamation Service.

The money herein authorized to be appropriated shall be reimbursed in accordance with the provisions of law applicable to said Indian lands.

**SPECIAL RECLAMATION INVESTIGATIONS.**

**AN ACT** Authorizing the Secretary of the Interior to investigate the feasibility of reclamation projects on the Columbia River and various other irrigation projects. (Act February 21, 1923, Public No. 433, 42 Stat. 1281.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, to be immediately available for expenditure by the Secretary of the Interior, namely:

For investigations of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, including the Columbia Basin project, \$100,000; the Umatilla Rapids project, \$50,000; in all, \$150,000.

For cooperative and miscellaneous investigations of the feasibility of reclamation projects, \$125,000 annually.

**WATER RIGHTS UNDER BLACKFEET PROJECT.**

**AN ACT** Authorizing the Secretary of the Interior to enter into an agreement with Toole County irrigation district, of Shelby, Mont., and the Cut Bank irrigation district, of Cut Bank, Mont., for the settlement of the extent of the priority to the waters of Two Medicine, Cut Bank, and Badger Creeks, of the Indians of the Blackfeet Indian Reservation. (Act February 26, 1923, 42 Stat. 1289.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior be, and he is hereby, authorized to enter into an agreement, jointly or separately, with the Toole County irrigation district, of Shelby, Mont., and the Cut Bank irrigation district, of Cut Bank, Mont., and thereby to fix the extent of the prior right of the Indians residing and entitled to reside on the Blackfeet Indian Reservation, collectively, to the waters of Two Medicine, Cut Bank, and Badger Creeks: *Provided*, That said districts shall furnish in advance the entire cost to be incurred in determining the amount of the water of said streams to which such Indians are so entitled to priority.

**RECLAMATION PROVISIONS OF THE APPROPRIATION ACT FOR THE DEPARTMENT OF AGRICULTURE.**

(Extracts from) an act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1924, and for other purposes. (Act February 26, 1923, Public, No. 446, 42 Stat. 1289.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of Agriculture for the fiscal year ending June 30, 1924, namely:

*General expenses, Bureau of Plant Industry.*—\* \* \* For investigations in connection with western irrigation agriculture, the utilization of lands reclaimed under the reclamation act, and other areas in the arid and semiarid regions, \$94,420.

*General expenses, Bureau of Soils.*—\* \* \* For examination of soils to aid in the classification of agricultural lands, in cooperation with other bureaus of the department and other departments of the Government, \$15,000.

*General expenses, Bureau of Public Roads.*—\* \* \* For investigating and reporting upon the utilization of water in farm irrigation, including the best methods to apply in practice; the different kinds of power and appliances, and the development of equipment for farm irrigation; the flow of water in ditches, pipes, and other conduits; the duty, apportionment, and measurement of irrigation water; the customs, regulations, and laws affecting irrigation; for the purchase and installation of equipment for experimental purposes; for the giving of expert advice and assistance; for the preparation and illustration of reports and bulletins on irrigation; for the employment of assistants and labor in the city of Washington and elsewhere; for rent outside of the District of Columbia; and for supplies and all necessary expenses, \$72,000.

For investigating and reporting upon farm drainage and upon the drainage of swamp and other wet lands which may be made available for agricultural purposes; for preparing plans for the removal of surplus water by drainage, and for giving expert assistance by advice or otherwise in the drainage of such lands; for conducting field experiments and investigations concerning the construction and maintenance of farm-drainage work; for investigating and developing equipment intended for the



construction and maintenance of farm-drainage structures; for the purchase of materials and equipment; and for preparing and illustrating reports and bulletins on drainage; and for the employment of assistants and labor in the city of Washington and elsewhere; for rent outside of the District of Columbia; and for supplies and all necessary expenses, \$72,260.

\* \* \* \* \*

*Demonstrations on reclamation projects.*—To enable the Secretary of Agriculture to encourage and aid in the agricultural development of the Government reclamation projects; to assist, through demonstrations, advice, and in other ways, settlers on the projects; and for the employment of persons and means necessary in the city of Washington and elsewhere, \$39,000.

### RELIEF TO WATER USERS ON FEDERAL IRRIGATION PROJECT.

AN ACT To extend the time for payment of charges due on reclamation projects, and for other purposes  
(Act of February 28, 1923, 42 Stat. 1324.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section 1 of the act entitled "An act to authorize the Secretary of the Interior to extend the time for payment of charges due on reclamation projects, and for other purposes," approved March 31, 1922, is amended by striking out the words "one year" where they appear in such section and inserting in lieu thereof the words "two years."

Sec. 2. That the Secretary of the Interior is authorized, in the manner and subject to the conditions imposed by such act of March 31, 1922, to extend for a period not exceeding two years from December 31, 1922, the date of any payment of any charge the date of payment of which has been extended under the provisions of section 1 of such act.

Sec. 3. That every charge, the date of payment of which is extended under the provisions of section 2 of this act, shall draw interest at the rate of 6 per centum per annum from the date from which it was so extended in lieu of any penalty that may now be provided by law, but in case such charge is not paid at the end of the period for which it is so extended any such penalty shall attach from the date the charge was originally due, as if no extension had been granted.

Sec. 4. That section 2 of such act of March 31, 1922, is amended by striking out the words "season of 1922" where they appear in such section and by inserting in lieu thereof the words "seasons of 1922 and 1923."

Sec. 5. That where an individual water user, or individual applicant for a water right under a Federal irrigation project constructed or being constructed under the act of June 17, 1902 (Thirty-second Statutes at Large, page 388), or any act amendatory thereof or supplementary thereto, is unable to pay any construction or operation and maintenance charge due excepting operation and maintenance charges for drainage on the Boise, Idaho, project, for the year 1922, or prior thereto, the Secretary of the Interior is hereby authorized, in his discretion, to add such accrued and unpaid charges to the construction charge of the land of such water user or applicant, and to distribute such accumulated charges equally over each of the subsequent years, beginning with the year 1924, at such rate per year as will complete the payment during the remaining years of the twenty-year period of payment of the original construction charge: *Provided*, That upon such adjustment being made, any penalties or interest which may have accrued in connection with such unpaid construction and operation and maintenance charges shall be canceled, and in lieu thereof the amount so due, and the payment of which is hereby extended, shall draw interest at the rate of 6 per centum per annum, paid annually from the time said amount became due to date of payment: *Provided further*, That the applicant for the extension shall first show to the satisfaction of the Secretary of the Interior detailed statement of his assets and liabilities and actual inability to make payment at the time of the application and an apparent ability to meet the deferred charges in 1924 and subsequent years: *And provided further*, That in case the principal and interest herein provided for are not paid in the manner and at the time provided by this act, any penalty now provided by law shall attach from the date the charge was originally due: *And provided further*, That similar relief in whole or in part may be extended by the Secretary of the Interior to a legally organized group of water users of a project, upon presentation of a sufficient number of individual showings made in accordance with the foregoing proviso to satisfy the Secretary of the Interior that such extension is necessary.

**SUIT RESPECTING KLAMATH PROJECT LAND AUTHORIZED.**

AN ACT Authorizing the State of California to bring suit against the United States to determine title to certain lands in Siskiyou County, Calif. (Act Mar. 3, 1923, 42 Stat. 1438.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That consent is hereby given that a suit or suits may be instituted by or in behalf of the State of California in the Supreme Court of the United States to determine the right, title, and interest of such State to certain lands in Siskiyou County, California, alleged to have been ceded by such State to the United States by act of the Legislature of the State of California entitled "An act authorizing the United States Government to lower the water levels of any or all of the following lakes: Lower or Little Klamath Lake, Tule or Rhett Lake, Goose Lake, and Clear Lake, situated in Siskiyou and Modoc Counties, and to use any part or all of the beds of said lakes for the storage of water in connection with the irrigation and reclamation operations conducted by the Reclamation Service of the United States; also ceding to the United States all the right, title, interest, or claim of the State of California to any lands uncovered by the lowering of the water levels of any or all of said lakes not already disposed of by the State," approved February 3, 1905, and in any such suit the right, title, and interest of such State and of the United States may be fully tested and determined if the Secretary of the Interior is made a party to such suit.

Upon the request of such Secretary the Attorney General of the United States is authorized and directed to defend the right, title, and interest of the United States to such land or any part thereof.

**APPROPRIATION FOR SPECIAL RECLAMATION INVESTIGATIONS.**

(Extract from) an act making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1923, and prior fiscal years, to provide supplemental appropriations for the fiscal year ending June 30, 1924, and for other purposes. (Act Mar. 4, 1923, 42 Stat. 1527.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1923, and prior fiscal years, to provide supplemental appropriations for the fiscal year ending June 30, 1924, and for other purposes, namely:

\* \* \* \* \*

**RECLAMATION SERVICE.**

For investigations of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, and for cooperative and miscellaneous investigations of the feasibility of reclamation projects, including personal services in the District of Columbia and elsewhere; purchase, repair, maintenance, hire and operation of motor-propelled or horse-drawn passenger-carrying vehicles; and for all other expenses; reimbursable in the case of any project if and when adopted for construction by the United States or other agency; to remain available until December 31, 1924, as follows: Columbia Basin project, \$100,000; Umatilla Rapids project, \$50,000; cooperative and miscellaneous investigations of reclamation projects, \$125,000; in all, \$275,000.

## LAW DECISIONS.

### DRAINAGE.

*Drainage works part of irrigation system.*—Under the national irrigation act of June 17, 1902 (32 Stat. 388), and the extension act of August 13, 1914 (38 Stat. 686), the Secretary of the Interior has authority to provide for drainage as part of an extensive irrigation project in order to prevent damage to property from the operation of the irrigation system, and his determination that the expense of necessary drainage for the prevention of future injuries is a proper operation and maintenance charge to be assessed against the users is controlling, the term "operating expense," when applied to an irrigation system, including all damages to persons or property that may result from operation. (*Nampa & Meridian Irr. Dist. v. Bond*, 288 Fed. 541. For opinion trial court see 283 Fed. 569.)

### WATER CHARGES.

*Yuma project suit.*—On April 30, 1923, the United States Supreme Court affirmed the decision of the United States Circuit Court of Appeals, sustaining the right of the Secretary of the Interior to issue the public notice of April 6, 1917, announcing a construction charge of \$75 per irrigable acre for lands in the Valley division of the Yuma Federal irrigation project in Arizona. Suit was brought by the Yuma County Water Users' Association against project officials for the purpose of contesting the right of the Secretary to fix the charge in question. The association contended that a certain letter by the Secretary of the Interior, dated May 10, 1904, was a public notice within the meaning of the reclamation law and fixed the maximum liability of the water users at \$35.26 per irrigable acre. The association also claimed that its contract provided that payment for construction should not be required until the project was completed and that the project was still incomplete, and therefore public notice announcing charges could not be legally issued. The United States took the position that the project was complete so far as the Valley division was concerned, that the Secretary's letter was not a public notice, and that the water users must pay the cost of construction as announced in the public notice of April 6, 1917. On February 26, 1920, after a trial on the merits, United States District Judge William H. Sawtelle dismissed the suit. From this decision the association appealed to the Circuit Court of Appeals, and on November 7, 1921, that court affirmed the decision of the trial court (275 Fed. 885). The decision of April 30, 1923, by our highest judicial tribunal, forbids further court action by the association.

*Extension of payments.*—The act of February 28, 1923 (42 Stat. 1324), authorizes the Secretary in his discretion to make certain extensions of time to water users within which to make payment of water charges. Regulations under this act were approved by the department March 7, 1923, and are contained in C. L. 1197.

### WATER RIGHTS.

*Waste water.*—About one-half of the water in Elgin Canyon Creek, which flows through the Okanogan Federal irrigation project in Washington, is waste water from that project and comes from another watershed by artificial means. The supreme court of the State of Washington in *Eglin v. Weatherstone* (212 Pac. 562) holds that such water is vagrant waste water, does not become a part of the natural flow of Elgin Canyon Creek after entering it, and may be used by the first person taking it from the stream, but that use of such water in one year does not give the user a right to it a second year, the vagrant waste waters of yesterday not being those of to-day.

*Interstate streams.*—One June 5, 1922, in the case of *Wyoming v. Colorado* (259 U. S. 419) the United States Supreme Court rendered an opinion in which the rights to the use of the waters of the Laramie River, were adjudicated. The Laramie is an innavigable stream which has its source in the mountains of northern Colorado, flows northerly in that State and crosses into Wyoming. The court found in this case that as between appropriators from the same stream, but in different States recognizing the doctrine of appropriation, the rule of priority has the same application to a stream flowing from one State to another that it has to streams wholly within one of them.

# ENGINEERING DATA FOR PROJECTS ON COMPLETION.

[The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams, and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canal, they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress.]

## Engineering data for projects when completed.

### RESERVOIRS.

Projects.	Name.	Area.	Capacity.	Spillways.			
				Length.	Elevation above stream bed.	Capacity.	
						Normal.	Maximum.
		Acres.	Acres-ft.	Fect.	Fect.	Sec.-ft.	Sec.-ft.
Arizona: Salt River.....	Roosevelt.....	18,100	1,575,000	420	240	113,000	150,000
California: Orland.....	East Park.....	1,850	51,000	415	88	8,000	12,000
Colorado: Uncompahgre	Taylor Park.....	2,260	106,000	(1)	(1)	(1)	(1)
Idaho:							
Boise.....	Deer Flat.....	9,835	177,000	None.			
Do.....	Arrowrock.....	2,860	280,000	402	247	15,000	40,000
Minidoka.....	Lake Walcott.....	11,850	150,000	2,385	42	40,000	60,000
Do.....	Jackson Lake.....	25,540	847,000	160	41	7,500	13,000
Montana:							
Milk River.....	St. Mary Lakes.....	6,910	124,000	500	20	500	20,000
Do.....	Sherburne Lakes.....	2,000	78,000	160	68	200	8,000
Do.....	Nelson Reservoir.....	4,560	68,500	(*)	23		
Do.....	Point of Rocks.....	180	830	740	8	0	700
Do.....	Beaver Creek.....	5,800	50,000	238	39	100	15,000
Do.....	Chain Lakes.....	9,400	244,000	300	58	300	10,000
Sun River.....	Willow Creek *.....	2,696	86,000	200	100	725	(1)
Do.....	Beaver Creek *.....	1,360	105,000	275	190		42,500
Do.....	Pishkun Reservoir *.....	1,542	45,700	Under	control.		
Do.....	Muddy Creek.....	1,828	33,000		80	284	(1)
Do.....	Benton Lake.....	9,300	144,000	Under	control.		
Nebraska-Wyoming:							
North Platte.....	Pathfinder.....	22,700	1,070,000	605	184	40,000	
Do.....	Lake Alice.....	900	11,400	100	18	2,500	
Do.....	Lake Minatare.....	2,240	60,780	100	55	2,000	
Do.....	Winters Creek Lake.....	360	3,000	None.			
Do.....	Guernsey.....	2,336	72,700	300	80	27,500	50,000
Nevada: Newlands.....	Lake Tahoe.....	120,000	120,000	85	6	525	575
Do.....	Lahontan.....	10,000	273,600	500	112	18,800	30,000
Do.....	Spanish Springs.....	9,400	300,000	60	96	1,600	1,600
New Mexico: Carlsbad.....	Avalon.....	970	7,000	1,026	21	86,000	120,000
Do.....	McMillan.....	6,600	45,000	1,750	26.1-24.9	34,500	60,000
New Mexico-Texas: Rio Grande.	Elephant Butte.....	40,080	2,638,000	275	193	8,000	16,000
Oregon: Umatilla.....	Cold Springs.....	1,500	50,000	330	90	6,000	6,000
Do.....	McKay.....	1,600	75,000	120	140	10,000	10,000
Oregon-California: Klamath.	Upper Klamath Lake.....	60,000	400,000	None.			
Do.....	Clear Lake.....	25,000	462,000	357	24	10,000	30,000
Do.....	Gerber.....	3,700	90,000	150	63		10,000
South Dakota: Belle Fourche.	Belle Fourche.....	8,010	203,000	314	100	2,000	2,000
Utah: Strawberry Valley.	Strawberry Valley.....	8,370	250,000	58	61	500	2,000
Washington:							
Okanogan.....	Salmon Lake.....	240	10,500	Siphon.	48		400
Do.....	Conconully.....	460	14,400	180	58	4,500	16,000
Yakima.....	Bumping Lake.....	1,300	34,000	235	36		6,000
Do.....	Lake Clealum.....	4,680	501,000	420	112		18,000
Do.....	Lake Kachess.....	4,540	210,000	250	53		7,200
Do.....	Tieton.....	2,500	202,500	390	206		50,000
Do.....	Lake Keechelus.....	2,550	152,000	300	60		10,000
Do.....	Clear Creek.....	270	5,830	261	58		
Wyoming: Riverton.....	Pilot Butte.....	882	30,000	100			500
Do.....	Bull Lake.....	3,100	145,000	170	67	4,000	8,000
Shoshone.....	Shoshone.....	6,000	450,000	300	233	11,000	30,000
Do.....	Ralston.....	200	2,100				
Do.....	Deaver.....	80	680	None.			

\* Undetermined.

\* 95,180 acre-feet only available; above fixed crest of spillway.

\* Average flow of stream on which reservoir is located.

\* No spillways: drainage limited: elevation is that of water surface.

\* Consists of 8 siphons each 5 feet high and 10 feet wide at throat.

\* Present capacity 16,700 acre-feet.

\* Tentative.

\* Present capacity 3,523 acre-feet.

## Engineering data for projects when completed—Continued.

## RESERVOIRS.

Projects.	Name.	Area.	Capacity.	Spillways.			
				Length.	Elevation above stream bed.	Capacity.	
						Normal.	Maximum.
<b>INDIAN PROJECTS.</b>							
<b>Montana:</b>		<i>Acres.</i>	<i>Acres.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Blackfoot.....	Two Medicine Lake.....	854	16,000	66	254	350	6,000
Do.....	Spring Lake.....	1,670	29,000		85		
Do.....	Four Horns.....	1,130	30,000		45		
Do.....	Guardipee.....	1,260	30,000		40		
Flathead.....	Dry Fork.....	330	3,400	250	28	500	1,500
Do.....	Horte.....	73	260	40	17	140	300
Do.....	Hubbart.....	400	12,000	265	95	5,000	5,000
Do.....	Kickinghorse.....	675	6,800		23		
Do.....	Little Bitterroot Lake.....	3,000	18,000		3		
Do.....	Lower Crow Creek.....	300	9,485	100	82	600	1,500
Do.....	McDonald Lake.....	220	10,600	100	81	4,000	6,000
Do.....	Mission.....	300	8,300	100	74	1,200	3,000
Do.....	Ninepipe.....	1,630	15,100		30		
Do.....	Pablo.....	2,100	29,600		36		
Do.....	Polson.....	70	1,700		80		
Do.....	Tabon.....	300	22,000	50	42	400	1,200
Do.....	Twin.....	70	937		25		
Fort Peck.....	Little Porcupine.....	390	3,900		14		
Do.....	Big Porcupine.....	400	2,800	100	25	750	3,500
Do.....	Poplar River.....	3,700	50,000	(1)			
Do.....	Wolf Creek.....	350	4,550	(1)			
Do.....	Smoke Creek.....	300	5,300	(1)			
<b>Total.....</b>		<b>488,561</b>	<b>12,371,832</b>				

## STORAGE DAMS.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Arizona: Salt River.....	Roosevelt <sup>a</sup> .....	Rubble masonry arch, gravity.	280	1,125	342,325
California: Orland.....	East Park <sup>a</sup> .....	Concrete arch, gravity.....	139	250	12,200
Colorado: Uncompahgre.....	Taylor Park.....	Undetermined.	(2)	(2)	(2)
Idaho:					
Boise.....	Upper Deer Flat <sup>a</sup> .....	Earth fill.....	70	4,000	1,190,275
Do.....	Lower Deer Flat <sup>a</sup> .....	do.....	40	7,200	1,207,606
Do.....	Deer Flat Forest <sup>a</sup> .....	do.....	16	950	22,500
Do.....	Arrowrock <sup>a</sup> .....	Rubble concrete arch, gravity.	349	1,100	585,130
Minidoka.....	Minidoka <sup>a</sup> .....	Rock fill, concrete core.....	86	937	242,500
Do.....	Jackson Lake <sup>a</sup> .....	Massive concrete gate section and earth fill.	67	4,450	345,400
Montana:					
Milk River.....	St. Marys Lake.....	Earth embankment.....	30	2,000	135,000
Do.....	Sherburne Lakes <sup>14</sup> .....	do.....	83	1,133	201,500
Do.....	Nelson Reservoir <sup>a</sup> .....	do.....	28	9,900	175,000
Do.....	Point of Rocks <sup>a</sup> .....	do.....	12.5	2,680	31,000
Do.....	Beaver Creek.....	do.....	49	6,000	568,000
Do.....	Connolly.....	do.....	68	3,125	2,010,000
Sun River.....	Willow Creek <sup>15</sup> .....	Earth fill.....	110	1,045	452,000
Do.....	Beaver Creek <sup>a</sup> .....	Masonry.....	205	820	195,000
Do.....	Pishkun <sup>16</sup> .....	Earth fill.....	48	8,600	444,000
Do.....	Muddy Creek.....	do.....	90	800	440,000
Do.....	Benton Lake.....	do.....	40	240	12,000

<sup>a</sup> Undetermined.<sup>b</sup> Average flow of stream on which reservoir is located.<sup>c</sup> No spillways; drainage limited; elevation is that of water surface.<sup>d</sup> Tentative.<sup>e</sup> Elevation above outlet.<sup>f</sup> Present capacity, 2,000 acre-feet Completed.<sup>g</sup> Present capacity, 8,200 acre-feet.<sup>h</sup> Present capacity, 5,500 acre-feet.<sup>i</sup> Present capacity, 12,000 acre-feet.<sup>j</sup> Present capacity, that of natural lake, 12,300<sup>k</sup> Not designed.<sup>l</sup> First development completed.<sup>m</sup> Completed to height of 75 feet<sup>n</sup> Completed to height of 19 feet

*Engineering data for projects when completed—Continued.*

## STORAGE DAMS—Continued.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Nebraska-Wyoming:	Pathfinder <sup>1</sup> .....	Broken range masonry arch.	218	432	60,210
North Platte.					
Do.	Pathfinder Dike <sup>1</sup> .....	Earth fill.....	40	1,650	152,000
Do.	Upper Lake Alice <sup>1</sup> .....	do.....	30	3,100	240,000
Do.	Lower Lake Alice <sup>1</sup> .....	do.....	23	2,550	119,000
Do.	Minatare <sup>1</sup> .....	do.....	65	3,700	570,000
Do.	Guernsey.....	Earth and rock fill.....	97	575	332,000
Nevada: Newlands.	Lake Tahoe <sup>1</sup> .....	Concrete sluiceway regulator.	14	109	425
Do.	Lahontan <sup>1</sup> .....	Earth and gravel fill with concrete spillways.	124	1,400	770,000
Do.	Spanish Springs.....	do.....	112	2,815	1,700,000
New Mexico:					
Carlsbad.	Avalon <sup>1</sup> .....	Earth and rock fill, concrete core.	50	1,380	168,773
Do.	McMillan <sup>1</sup> .....	Earth and rock fill.....	55	2,070	150,744
New Mexico-Texas:	Elephant Butte <sup>1</sup> .....	Rubble concrete, gravity.....	306	1,155	605,200
Rio Grande.					
Do.	Elephant Butte Dike <sup>1</sup> .....	Earth and rock fill.....	42	2,000	179,000
Oregon: Umatilla.	Cold Springs <sup>1</sup> .....	do.....	98	3,860	789,500
Do.	McKay.....	Earth and gravel fill.....	160	2,600	2,300,000
Oregon-California:	Clear Lake <sup>1</sup> .....	Rock fill.....	33	790	56,600
Klamath.					
Do.	Link River <sup>1</sup> .....	Concrete.....	22	435	2,200
Do.	Gerber.....	Concrete arch.....	85	470	9,500
South Dakota: Belle Fourche.	Belle Fourche <sup>1</sup> .....	Earth fill.....	122	6,200	1,600,000
Utah: Strawberry Valley.	Indian Creek Dike <sup>1</sup> .....	Earth fill, reinforced concrete.	37	1,311	101,107
Do.	Strawberry Dam <sup>1</sup> .....	Earth fill, reinforced concrete core wall.	72	488	108,415
Washington:					
Okanogan.	Salmon Lake <sup>1</sup> .....	Earth embankment.....	42	1,260	194,288
Do.	Conconully <sup>1</sup> .....	Hydraulic earth fill.....	67	1,000	354,242
Yakima.	Bumping Lake <sup>1</sup> .....	Earth fill.....	45	3,425	247,700
Do.	Lake Cle Elum <sup>1</sup> .....	Earth and gravel fill.....	125	700	462,000
Do.	Lake Kachess <sup>1</sup> .....	do.....	63	1,400	193,300
Do.	Tieton.....	Earth and rock fill, concrete core wall.	244	905	1,850,000
Do.	Lake Keechelus <sup>1</sup> .....	Earth and gravel fill.....	70	6,500	639,000
Do.	Clear Creek <sup>1</sup> .....	Single concrete arch.....	84	404	4,100
Wyoming: Riverton.	Pilot Butte.....	Earth embankment.....	40	2,400	130,000
Do.	Bull Lake.....	do.....	75	3,300	600,000
Shoshone.	Shoshone <sup>1</sup> .....	Rubble concrete arch.....	328	200	78,576
Do.	Ralston <sup>1</sup> .....	Earth fill.....	50	150	24,740
Do.	Deaver.....	do.....	14	1,300	30,300
INDIAN PROJECTS.					
Montana:					
Blackfoot.	Two Medicine <sup>1</sup> .....	Earth embankment.....	37	900	28,600
Do.	Spring Lake.....	do.....	45	1,625	156,000
Do.	Four Horns <sup>1</sup> .....	do.....	55	1,650	46,000
Do.	Guardipee.....	do.....	50	613	35,000
Flathead.	Dry Fork <sup>1</sup> .....	Earth.....	33	3,250	118,500
Do.	Horte <sup>1</sup> .....	do.....	16	930	3,800
Do.	Hubbart.....	Concrete arch.....	130	500	16,000
Do.	Kickinghorse.....	Earth.....	31	3,700	181,000
Do.	Little Bitterroot <sup>1</sup> .....	do.....	10	800	8,000
Do.	Lower Crow Creek.....	do.....	92	860	330,000
Do.	McDonald Lake <sup>1</sup> .....	do.....	57	1,600	214,000
Do.	Mission.....	do.....	80	2,500	346,000
Do.	Ninepipe <sup>1</sup> .....	do.....	38	2,180	162,000
Do.	Pablo <sup>1</sup> .....	do.....	46	14,000	1,028,000
Do.	Polson.....	do.....	85	1,100	170,000
Do.	Taber.....	Loose rock and earth.....	58	2,200	140,000
Do.	Twin.....	Earth.....	30	1,600	46,000
Fort Peck.	Frazier <sup>1</sup> .....	Earth fill.....	17	4,200	43,400
Do.	Big Porcupine.....	do.....	30	1,500	118,000
Do.	Poplar River.....	do.....	51	5,200	1,500,000
Do.	Wolf Creek.....	do.....	36	800	85,300
Do.	Smoke Creek.....	do.....	48	1,600	76,000
Total.....					28,375,956

<sup>1</sup> Completed.<sup>2</sup> Including spillway and approaches, 1,675 feet.<sup>3</sup> Including spillway, 619,000 cubic yards.<sup>4</sup> Present development, rock-fill timber crib; height, 11 ft.; volume, 1,500 cubic yards.<sup>5</sup> Completed, except automatic crest.<sup>1</sup> Completed for 4,000 acre-feet.<sup>2</sup> First development; 83,500 cubic yards, 2,000 acre-feet.<sup>3</sup> First development, 114,000 cubic yards; 8,200 acre-feet.<sup>4</sup> First development, 64,191 cubic yards, 5,000 acre-feet.<sup>5</sup> First development, 318,435 cubic yards; 12,000 acre-feet.

## Engineering data for projects when completed—Continued.

## DIVERSION DAMS.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Arizona: Salt River..	Granite Reef <sup>*</sup>	Rubble concrete weir.....	38	1,000	40,000
Do.....	Power Canal <sup>*</sup>	do.....	12 $\frac{1}{2}$	400	4,800
Do.....	Joint Head <sup>*</sup>	Concrete weir.....	10	600	1,740
Arizona - California:	Laguna <sup>*</sup>	Indian weir, concrete and rock fill. <sup>27</sup>	10	4,780	441,732
Yuma.					
California: Orland...	South Canal <sup>*</sup>	Concrete on piling, with rock fill.	20	900	2,886
Do.....	North side <sup>*</sup>	Concrete weir, with removable timber crest.	8	360	270
Do.....	East Park Feed Canal. <sup>*</sup>	Concrete arch.....	44	154	1,777
Colorado:					
Grand Valley....	Colorado River Diversion. <sup>*</sup>	Masonry ogee weir with roller crest 10 to 15 feet high.	24	546	25,082
Uncompahgree....	Gunnison <sup>*</sup>	Crib with rock fill and movable flashboards.	15 $\frac{1}{2}$	237	3,200
Do.....	Montrose and Delta <sup>*</sup>	Timber weir with concrete apron sluiceway and cut-off wall.	6.8	68 $\frac{1}{2}$	172
Do.....	Loutsenhizer <sup>*</sup>	Pile and timber weir.....	8	100	.....
Do.....	Selig <sup>*</sup>	Pile and timber weir with concrete sump.	6	95 $\frac{1}{2}$	205
Do.....	Ironstone <sup>*</sup>	Pile foundation with timber deck and needle flashboards.	8 $\frac{1}{2}$	58 $\frac{1}{2}$	.....
Do.....	East <sup>*</sup>	Pile and timber weirs, movable flashboards.	(20)	144	.....
Do.....	Garnet <sup>*</sup>	Rock baskets, faced and surfaced with concrete.	6 $\frac{1}{2}$	75	500
Idaho:					
Boise.....	Boise River <sup>*</sup>	Rubble concrete weir.....	45	246 <sup>28</sup>	21,750
Do.....	Black Canyon <sup>19</sup>	Concrete masonry.....	168	1,075	90,000
Minidoka.....	Minidoka <sup>*</sup>	Combined diversion and storage dam. (See Storage.)			.....
Montana:					
Milk River.....	Swift Current <sup>*</sup>	Earth and timber crib.....	13	2,800	86,700
Do.....	St. Mary <sup>*</sup>	Concrete.....	6.5	196	480
Do.....	Chinook <sup>29</sup>				
Do.....	Dodson <sup>*</sup>	Timber crib rock filled, concrete abutments, movable crest.	25	319	12,000
Do.....	Vandalia <sup>*</sup>	Reinforced concrete, automatic movable crest.	34	1,500	11,000
Sun River.....	Sun River <sup>*</sup>	Concrete masonry.....	132	212	6,200
Montana-North Dakota: Lower Yellowstone.	Lower Yellowstone <sup>*</sup>	Rock-filled, timber weir.....	12	700	14,500
Nebraska-Wyoming: North Platte.	Whalen <sup>*</sup>	Concrete weir.....	29	300	80,740
Do.....	Horse Creek <sup>*</sup>	do.....	12	100	220
Nevada: Newlands....	Truckee River <sup>*</sup>	16 concrete sluiceways.....	22	171	3,322
Do.....	Carson River <sup>*</sup>	23 concrete sluiceways.....	20	240	2,707
New Mexico: Carlsbad.	Avalon <sup>*</sup>	Combined storage and diversion. (See Storage.)			.....
New Mexico-Texas: Rio Grande.	Leasburg <sup>*</sup>	Rubble concrete weir.....	10.8	600	2,413
Do.....	Mesilla <sup>*</sup>	do.....	16.7	303	2,876
Do.....	Mexican <sup>31</sup>	Rubble masonry.....	4.7	320	1,200
Do.....	Percha <sup>*</sup>	Rubble concrete.....	17	350	4,346
Oregon: Umatilla....	Feed Canal (Echo) <sup>*</sup>	Concrete weir on timber crib.	2 $\frac{1}{2}$	400	296
Do.....	Maxwell Canal <sup>*</sup>	do.....	2 $\frac{3}{8}$	175	43
Do.....	Three-Mile Falls <sup>*</sup>	Concrete multiple arch.....	24	800	4,160
Oregon - California: Klamath.	Lost River <sup>*</sup>	Hollow reinforced concrete.....	40	290	5,530
Do.....	Lower Lost River <sup>19</sup>	Reinforced concrete.....	15	204	625
Do.....	Malone <sup>*</sup>	Earth, with concrete spillway.	30	515	18,500
South Dakota: Belle Fourche.	Diversion <sup>*</sup>	Concrete weir.....	23	400	12,149
Utah: Strawberry Valley.	Spanish Fork <sup>*</sup>	do.....	16	70	1,262
Do.....	Indian Creek Crossing <sup>*</sup>	Earth.....	17	1,300	15,183

<sup>\*</sup> Completed.<sup>19</sup> Under construction.<sup>27</sup> Maximum height 40 feet from bottom of sheet piling to top of dam; water raised 10 feet.<sup>28</sup> Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.<sup>29</sup> Length, including logway.<sup>30</sup> Will be constructed by irrigation districts. No data available as to type and dimensions.<sup>31</sup> Constructed by Mexican authorities and used jointly.

*Engineering data for projects when completed—Continued.*

## DIVERSION DAMS—Continued.

Projects.	Name.	Type.	Maximum height.	Crest length.	Volume.
			<i>Feet.</i>	<i>Feet.</i>	<i>Cubic yds.</i>
Washington:					
Okanogan	Salmon Creek <sup>1</sup> .....	Concrete weir.....	44	50	132
Yakima	Sunnyside <sup>1</sup> .....	Concrete ogee weir.....	84	500	2,291
Do	Tieton Diversion <sup>1</sup> .....	Concrete and rock-filled crib.	3	110	334
Wyoming:					
Riverton	Wind River <sup>1</sup> .....	Concrete weir with earth embankment.	37	2,285	123,860
Shoshone	Corbett <sup>1</sup> .....	Reinforced concrete weir.....	18	400	4,951
Do	Willwood <sup>1</sup> .....	Concrete gravity, with ogee weir section.	69.5	320	22,119
INDIAN PROJECTS.					
Montana:					
Blackfeet	Two Medicine.....	Brush and rock.....	4	165	175
Do	Blacktail <sup>1</sup> .....	Concrete.....	14	54	290
Do	Badger, Birch, and Cut Bank.	Not yet designed.....			
Flathead	Jocko River.....	Concrete <sup>12</sup> .....			
Do	North Fork Jocko River.	do.....	18	100	900
Do	Middle Fork Jocko River.	do. <sup>12</sup> .....			
Do	Camas A <sup>1</sup> .....	Arched masonry.....	25	125	500
Do	Mud Creek <sup>1</sup> .....	Concrete.....	12	18	116
Do	Crow Creek <sup>1</sup> .....	do.....	13	82	330
Do	Post Creek—Kicking-horse Feeder. <sup>1</sup>	Log crib, rock filled.....	7	110	1,500
Do	Post Creek—Pablo Feeder.	Concrete <sup>12</sup> .....			
Do	Mission Creek <sup>1</sup> —B Lateral.	Log apron.....	3	8	
Do	Mission Creek <sup>1</sup> —Pablo Feeder.	Concrete.....	11	60	135
Do	Dry Creek <sup>1</sup> .....	do.....	10	25	95
Do	Other small creeks.....	do.....			
Fort Peck	Little Porcupine <sup>1</sup> .....	Concrete weir on timber crib.	4	150	250
Do	Poplar River <sup>1</sup> .....	do.....	4	300	180
Do	Big Porcupine <sup>1</sup> .....	do.....	6	150	185
Do	Big Muddy.....	Concrete.....	17	72	340
Total					1,079,859

<sup>1</sup> Completed.<sup>12</sup> Not designed.<sup>13</sup> Under construction.

## IRRIGABLE AREA, PRESENT STATUS.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	With-drawn.			Rail-road, unsold.	Other.	
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Arizona:								
Salt River.....	16,170						197,000	213,170
Gravity system.....							183,247	183,247
Pumping system.....	16,170						13,753	29,923
Arizona-California: Yuma....	17,493	853	33,284		8,200		50,170	110,000
Arizona—								
Valley.....	6,070		1,000				42,930	50,000
Mesa.....	5,223	853	31,884				7,040	45,000
California—Reservation..	6,200		400		8,200		200	15,000
California:								
Orland—Main.....							120,665	120,665
Colorado:								
Grim Valley.....	13,442	403	12,310				28,845	55,000
Garfield gravity.....	10,912	403	8,280				15,405	36,000
Garfield pumping.....	2,530		4,030				3,440	10,000
Orchard Mesa pump-ing.....							10,000	10,000
Uncompahgre.....	19,543	1,364	673				75,830	97,410
South Canal system.....	2,330	306	37				6,339	9,012
West Canal system.....	2,286	10	12				4,033	6,341
Montrose and Delta canal system.....	5,376	70	31				23,257	28,734
Loutsenhizer canal system.....	230						6,463	6,693
Selig Canal system.....	4,229	511	479				7,433	12,652
Ironstone Canal system.....								
East Canal system.....	1,203	65	20				16,782	18,040
Garnet Canal system.....	3,881	402	94				8,877	13,254
	8						2,676	2,684

<sup>1</sup> Includes 320 acres of vested rights and 171 acres of town and school sites.



*Engineering data for projects when completed—Continued.*

## IRRIGABLE AREA, PRESENT STATUS—Continued.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	Withdrawn.			Railroad, unsold.	Other.	
<b>Idaho:</b>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Boise.....	67,468		5,560	5,980		274,933		353,941
Arrowrock (Idaho)...	66,229			60		208,742		270,031
Arrowrock (Oregon)...	1,239					5,697		6,936
Notus.....						6,874		6,874
Hillcrest.....			2,230			11,870		14,100
Black canyon.....			3,330	5,920		46,750		56,000
King Hill.....	516	71	6	400		15,890		16,823
Minidoka.....	96,258	449	106,840	8,467		24,548		236,562
Gravity.....	66,000	449		305		5,848		72,602
Pumping.....	30,258			322		18,380		48,960
North Side pumping extension.....			106,840	7,840			320	115,000
<b>Montana:</b>								
Huntley.....	26,176		2,570				3,727	32,473
Gravity.....	21,342		1,854				3,727	26,933
Pumping.....	4,634		706					5,540
Divisions—								
Prior.....	23,515		1,864				2,947	28,326
Eastern.....	967						780	1,747
Fly Creek.....	1,694		706					2,400
Milk River.....	31,056		16,632	6,194		100,219		154,101
Chinook division.....	1,941		2,148	1,223		51,919		57,231
Malta division.....	22,782		13,980	3,768		33,209		73,739
Glaagow division.....	6,333		504	1,203		15,091		23,131
Sun River.....	42,348		38,026	9,181		69,296		158,851
Sun River Slope.....	700		12,900	1,100		2,300		17,000
Big Coulee.....				356		1,962		2,318
Greenfields.....	24,734		21,915	4,771		20,701		72,121
Mill Coulee.....	3,000		3,000	500		2,000		8,500
Fort Shaw.....	11,914		211	154		1,633		13,912
Vaughn.....				500		9,500		10,000
Benton.....	2,000			1,800		31,200		35,000
<b>Montana-North Dakota:</b>								
Lower Yellowstone.....	13,636		2,412	986		95	42,400	59,529
Montana.....								39,208
North Dakota.....								20,321
Divisions—								
Gravity.....								57,221
Pumping.....								2,308
<b>Nebraska-Wyoming:</b>								
North Platte.....	134,886		17,454	9,254		75,339		236,933
Interstate division.....	83,697		1,443	529		29,264		114,933
Nebraska.....	81,086		1,143	529		28,985		111,743
Wyoming.....	2,611		300			279		3,190
Fort Laramie division.....	44,689		15,511	7,325		39,475		107,000
Nebraska.....	8,550		7,200	4,000		32,100		51,850
Wyoming.....	36,139		8,311	3,325		7,375		55,150
Northport division, Nebraska.....	6,500		500	1,400		6,600		15,000
<b>Nevada: Newlands.</b>	82,525	4,112	25,486		23,877	20,000	53,000	150,000
Carson division.....	28,465	4,112	3,806		4,877	2,500	39,140	83,000
Truckee division.....	4,060		2,080			2,000	13,860	22,000
Pyramid division.....			4,500		19,000	1,500		25,000
Lovelock division.....			15,000			14,000		29,000
<b>New Mexico: Carlisbad.</b>	45						24,946	24,991
<b>New Mexico-Texas:</b>								
Rio Grande.....	1,500	100	700	1,000			146,700	150,000
New Mexico.....	1,500	100	700	1,000			82,700	86,000
Texas.....							64,000	64,000
Divisions—								
Rincon.....		20		700			15,900	17,000
Leasburg.....	600	40	640	200			29,950	31,000
Mesilla.....	900	40	60	100			45,850	47,000
El Paso.....							55,000	55,000
<b>North Dakota:</b>								
Williston.....	254	139		23			10,337	10,753
<b>Oregon:</b>								
Umatilla.....	5,413		2,376			3,319	17,192	28,300
East division.....	3,030					1,407	12,563	17,000
West division.....	2,383		2,376			1,912	4,629	11,300

\* Three thousand acres to be allotted to about 600 Indians; remainder of land to be sold in accordance with act (33 Stat. 225).

*Engineering data for projects when completed—Continued.*

## IRRIGABLE AREA, PRESENT STATUS—Continued.

State, project, and division.	Public land.			State land unsold.	Indian land.	Private land.		Total.
	Entered.	Open.	With-drawn.			Rail-road, unsold.	Other.	
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Oregon-California: Klamath..	5,917		20,776				142,704	169,397
Oregon.....	3,002		1,223				105,171	109,396
California.....	2,915		19,553				37,533	60,001
Divisions—								
Main.....	2,732						39,688	42,420
Tule Lake.....	3,185		20,776				239	24,200
Pumping.....							20,595	20,595
Langell Valley.....							22,282	22,282
Bonanza Springs.....							5,900	5,900
Lower Klamath Lake.....							54,000	54,000
South Dakota: Belle Fourche.....	37,732	117	12,008	667			45,907	96,431
Utah: Strawberry Valley.....	1,953						53,436	55,389
High Line.....	1,953						20,917	22,870
Spanish Fork.....							22,519	22,519
Springville-Mapleton.....							10,000	10,000
Washington:								
Okanogan.....	116						7,560	7,676
Gravity.....								6,501
Pumping.....								1,175
Yakima.....	7,358		13,688	5,969	241	21,729	291,032	339,987
Sunnyside.....	2,637			30	241		104,702	107,600
Tieton.....	2,048			4			29,948	32,000
Rosa.....	120		1,523	2,067		11,310	43,330	58,360
Moxee.....	1,663		775	1,332		2,788	30,197	36,750
Kittitas.....			4,990	1,406		3,986	59,955	70,267
Kennewick.....	900		6,400	1,100		3,700	22,900	35,000
Wyoming:								
Riverton.....			69,000		1,000		30,000	100,000
Shoshone.....	63,265	1,816	60,573	5,399		987	6,960	139,000
Montana:								
Frannie division.....	87			4				91
Wyoming:								
Garland division.....	63,178	1,816	60,573	5,395		987	6,960	138,909
Frannie division.....	40,310	646	605	352			1,981	43,894
Willwood division.....	22,868	1,170	10,556	1,343		987	1,691	38,615
Heart Mountain division.....			16,312	500			788	17,600
			33,100	3,200			2,500	38,800
Total primary projects.....	635,070	9,424	440,374	53,490	33,318	46,130	1,806,576	3,026,362
INDIAN PROJECTS.								
Montana:								
Blackfoot.....					107,500			107,500
Cutbank North.....					9,000			9,000
Cutbank South.....					18,000			18,000
Two Medicine.....					44,000			44,000
Badger-Fisher.....					30,000			30,000
Pegán.....					3,000			3,000
Birch Creek.....					3,500			3,500
Flathead.....	43,008			862	33,225		47,405	124,500
Camas.....	8,576				337		1,587	10,500
Mission Valley.....	34,210			862	25,920		41,008	102,000
Jocko.....	222				6,968		4,810	12,000
Fort Peck.....	9,713	107	100	80	133,394		10,000	153,394
Little Porcupine.....					1,865		547	2,412
Poplar.....					21,300		2,700	24,000
Big Porcupine.....					3,994		1,400	5,394
Big Muddy.....					19,100		900	20,000
Missouri.....					79,535		4,053	83,588
Galpin Bottom pumping.....	9,713	107	100	80				10,000
Milk River pumping.....					7,600		400	8,000
Total Indian projects.....	52,721	107	100	942	274,119		57,405	385,394
Total, all projects..	687,791	9,531	440,474	54,432	307,437	46,130	1,865,981	3,411,776

\* Includes some public land, but distribution not known.

\* Distribution estimated.

## CROP STATISTICS.

Summary of crop reports on Government reclamation projects in 1922—area (acres).<sup>1</sup>

State and project.	Cereals.					Other grain and seed.					Hay and forage.					Total.			
	Barley.	Corn, In-	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain.)	Flaxseed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.		Corn fodder.	Other forage.	Pasture.
Arizona: Salt River.....	14, 775	195	3, 381	.....	20, 547	38, 898	16, 475	.....	17, 497	.....	.....	17, 497	47, 796	.....	.....	.....	205	16, 690	64, 691
Arizona-California: Yuma.....	240	.....	.....	.....	1, 030	1, 270	.....	.....	3, 470	.....	.....	19, 945	22, 735	.....	235	.....	.....	5, 945	23, 915
California: Orland.....	593	.....	.....	.....	101	694	.....	.....	1, 537	.....	.....	1, 537	6, 063	.....	473	.....	15	4, 887	11, 438
Colorado:																			
Grand Valley.....	1, 286	.....	690	.....	1, 988	3, 904	401	.....	.....	.....	.....	401	4, 982	.....	47	1, 316	989	7, 334	7, 334
Uncompahgre.....	137	2, 062	4, 550	4	9, 718	16, 471	197	72	.....	.....	.....	269	23, 280	229	521	264	265	5, 877	30, 456
Idaho:																			
Boise.....	3, 050	6, 990	2, 425	190	27, 618	40, 273	985	5, 790	.....	.....	11	6, 786	38, 654	7, 100	70	410	.....	6, 100	52, 334
King Hill.....	30	181	115	.....	245	581	113	.....	.....	.....	.....	113	3, 474	25	121	10	.....	669	4, 299
Mindoka.....	1, 782	1, 318	2, 867	5	9, 950	15, 922	155	1, 448	.....	.....	.....	1, 603	24, 178	1, 928	154	147	23	4, 343	30, 773
Gravity division.....	1, 182	60	1, 120	.....	9, 320	11, 682	25	1, 120	.....	.....	.....	1, 145	15, 215	311	.....	19	.....	1, 796	17, 341
Pumping division.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montana:																			
Huntley.....	223	425	1, 624	4	5, 793	7, 879	32	120	.....	.....	.....	152	6, 167	2	40	64	41	12, 850	19, 164
Milk River.....	25	96	723	.....	1, 931	2, 774	164	.....	.....	83	.....	247	4, 365	17	10, 610	78	.....	158	16, 228
Sun River.....	70	62	123	.....	675	930	.....	20	.....	.....	.....	20	5, 185	27	265	.....	.....	649	6, 126
Fort Shaw division.....	405	.....	1, 127	.....	11, 913	13, 445	20	.....	.....	80	.....	100	1, 484	11	350	.....	.....	234	2, 079
Greenfields division.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lower Yellowstone.....	116	972	1, 296	.....	3, 317	5, 701	72	5	.....	44	.....	121	6, 463	160	308	122	1, 162	374	8, 589
North Platte.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interstate division.....	3, 932	11, 614	6, 781	352	7, 810	30, 499	.....	43	.....	.....	26	69	27, 662	.....	722	383	40	2, 081	30, 838
Fort Laramie division.....	413	3, 600	3, 900	59	5, 839	13, 811	.....	.....	5	64	40	109	2, 106	.....	744	84	.....	331	3, 265
Northport division.....	133	800	282	.....	477	1, 847	.....	.....	.....	.....	.....	.....	157	.....	22	.....	.....	745	924
Nevada: Newlands.....	437	160	72	.....	2, 410	3, 079	.....	.....	.....	.....	.....	1, 709	31, 103	.....	114	.....	.....	6, 402	37, 619
New Mexico: Carlisle.....	.....	.....	.....	.....	1, 382	690	1, 629	.....	80	.....	.....	324	6, 492	.....	.....	.....	.....	877	7, 369
New Mexico-Texas: Rio Grande.....	448	10, 905	923	.....	7, 769	20, 045	118	.....	206	.....	.....	324	33, 971	111	1, 409	758	42	5, 551	42, 031
North Dakota: Williston.....	72	25	86	.....	50	243	70	.....	.....	.....	.....	70	10, 366	111	280	78	.....	360	1, 376
Oregon: Umatilla.....	60	123	2	.....	64	219	.....	.....	.....	.....	.....	.....	15, 966	10	774	61	.....	732	11, 242
Oregon-California: Klamath.....	949	.....	984	587	3, 637	6, 157	.....	.....	.....	.....	.....	.....	28, 945	214	774	.....	.....	9, 270	37, 910
South Dakota: Belle Fourche.....	1, 264	7, 130	5, 060	.....	5, 482	18, 946	883	95	.....	19	.....	997	28, 945	214	2, 563	103	.....	5, 230	37, 105
Utah: Strawberry Valley.....	525	293	1, 246	18	6, 884	8, 966	.....	108	.....	.....	.....	108	11, 970	147	2, 665	.....	296	2, 490	15, 568
Washington:																			
Okanagan.....	.....	4	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	561	.....	74	14	.....	48	697



Summary of crop reports on Government reclamation projects in 1922—area (acres)—Continued.

State and project.	Vegetables and truck.						Fruits and nuts.							
	Beans.	Onions.	Potatoes.		Truck.	Total.	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.	Miscellaneous.	Total.
			White.	Sweet.										
Oregon-California: Klamath.			363		62	455								
South Dakota: Belle Fourche.	3		311		171	485								
Utah: Strawberry Valley.	51	12	572	2	281	918	62	121		1		31	138	353
Washington: Oriskany.														
Okanogan.			27		122	149	4,129	13	62	11		45		4,260
Yakima.														
Sunnyside division.	206	55	9,544	209	3,442	13,456	10,203	908	1,541	384		610		13,646
Tieton division.	248	76	1,713		200	2,237	7,180	537	1,573			210		9,500
Wyoming: Shoshone.	37	5	3,726		197	3,965	18							18
Garland division.			263		62	325								
Frankie division.														
Total	4,102	1,502	78,507	856	23,510	108,477	26,747	1,997	4,201	1,236	2,278	2,156	2,901	41,51

State and project.	Miscellaneous.					Irrigated—no crop.							Total irrigated.
	Beets, sugar.	Cotton.	Cane.	Other.	Total.	Duplicated.	Total cropped.	Young alfalfa.	Young fruit.	Fall plowing.	Miscellaneous.	Duplicated.	
Arizona: Salt River.		71,238			71,238	14,020	191,920				11,410		203,330
Arizona-California: Yuma.		21,420	15		21,435	18,370	53,970						53,970
California: Orland.	3				3	3,746	11,800	822	2,081	629		212	15,120
Colorado: Grand Valley.	989			2,961	3,950	5,165	11,840	811	18	1,546	332	2,177	12,370
Uncompahgre.	1,051			217	1,268	4,332	61,700	2,306	62	2,910	3,141	5,389	64,730
Idaho: Boise.				130	130	7,400	108,500	1,700	300	267	1,500	493	112,000
King Hill.							6,060	376	240			6,440	
Mindoka.													
Gravity division.	1,945			500	2,505	610	57,520	3,125	65	142	2,526	345	60,300
Pumping division.	3,320				3,320	829	42,200	802				535	45,200

	3,106 3	31	3,137 3	11,183 367	19,820 18,150	57	18,170	19,820
<b>Montana:</b>								
Huntley.....								
Milk River.....								
Sun River.....								
Fort Shaw division.....		15	15		7,470		640	8,110
Greenfields division.....		12	12		15,800		5	12,420
Montana-North Dakota: Lower Yellow- stone.....	1,107	34	1,216	1,107	15,400		200	15,600
Nebraska-Wyoming: North Platte.....								
Interstate division.....	10,614	392	11,006		86,400	6,125	154	87,500
Fort Laramie division.....	391	146	578		20,100	1,866	100	20,300
Northport division.....	578		578	28	3,460		200	3,660
Nevada: Newlands.....		645	645	159	42,300		2,570	44,860
New Mexico: Carlsbad.....	28,260		28,344	15,759	22,450	240	1,410	24,960
New Mexico-Texas: Rio Grande.....	26,422	2,426	28,344	16,431	84,410		5,180	89,590
North Dakota: Williston.....	43	80	28,971	13	1,570	30	17	1,590
Oregon: Umatilla.....		13	188	12,300	650	47	23	13,270
Oregon-California: Klamath.....		24	24	315	32,960		68	35,000
South Dakota: Belle Fourche.....	324	29	353	56,920			3,050	61,160
Utah: Strawberry Valley.....	4,160	267	4,427		30,340	105	305	30,520
Washington: Okanogan.....		64	64	334	4,840	33	295	5,570
Yakima.....								
Sunnyside division.....	927	135	1,062	2,247	80,760	1,935	11,074	95,000
Tieton division.....	50	223	272	3,020	26,400	380	600	28,700
<b>Wyoming:</b>								
Shoshone.....								
Garland division.....	947		947		32,400	608	153	32,720
Frannie division.....	66	8	74		9,430	458	318	10,060
<b>Total.....</b>	<b>29,654</b>	<b>6,415</b>	<b>198,045</b>	<b>106,626</b>	<b>1,169,100</b>	<b>22,428</b>	<b>7,762</b>	<b>1,202,130</b>

\* Figures for Greenfields division, Sun River project, are for 198 irrigated farms, which included small tracts farmed without irrigation.

Summary of crop reports on Government reclamation projects in 1922.—Total yields.

State and project.	Cereals.					Other grain and seed.					Hay and forage.							
	Barley.	Corn, Indian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flax seed.	Millet seed.	Total.	Alfalfa hay.	Clover hay.	Other hay.	Corn fodder.	Other forage.	Total.
Arizona: Salt River.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Arizona-California: Yuma.	591,000	5,571	158,484		513,675	1,268,730			629,892			629,892	191,184				1,025	192,209
California: Orland.	5,285				18,752	24,047	58,044		103,672			103,672	48,333					49,166
Colorado:	13,788				2,813	16,601			74,980			74,980	24,563				148	25,423
Grand Valley.		24,565	11,991		30,570	67,156	860					860	13,268		60	2,366		15,694
Uncompagire.	2,971	51,841	119,135	65	226,705	400,720	734	255				959	56,415	324	599	831	2,300	60,460
Idaho:																		
Boise.	85,400	356,400	84,875	2,850	883,776	1,413,391	4,039	34,740			242	39,021	177,808	12,070	210	4,510		194,598
King Hill.	465	6,350	4,385		4,767	15,967	570					570	14,557	47	221	97		14,922
Minidoka.																		
Gravity division.	61,250	44,070	87,687	30	289,077	482,114	420	4,994				5,414	74,286	3,808	262	1,018	386	79,820
Pumping division.	24,884	1,537	34,722		266,189	327,352	48	4,265				4,313	39,343	463		189		39,965
Montana:																		
Huntley.	6,571	9,164	47,068	128	115,416	178,347	24	982				1,006	14,102	8	26	142	317	14,595
Milk River.	400	3,410	11,651		21,737	37,218	154					594	7,106	27	6,761	122		14,016
Sun River.																		
Fort Shaw division.	1,115	1,395	2,559		8,971	14,040		62				62	7,537	34	246			7,817
Greenfields division.	8,017		34,299		225,665	267,981	62					415	3,065	20	385			3,470
Montana-North Dakota:																		
Lower Yellowstone.	2,461	27,980	45,794		61,282	137,517	280	10			236	526	12,560	309	5,165	331	331	18,696
Nebraska-Wyoming:																		
North Platte.																		
Interstate division.	109,542	213,830	158,574	3,579	135,449	621,034		230			259	489	47,097		552	1,520	473	40,642
Fort Laramie division.																		
Northport division.	6,192	87,150	98,230	253	65,011	256,836			15	412	368	795	4,818		616	306		5,740
Nevada: Newlands.	2,193	17,634	11,408		6,075	37,310												269
New Mexico: Carlsbad.	9,912	3,666	1,875		50,333	65,786							95,980		118			96,098
New Mexico-Texas: Rio Grande.					6,065	12,093	3,603		3,030			6,633	16,930					16,930
North Dakota: Williston.	7,848	233,218	25,749		132,997	399,812	341		4,088			4,427	107,928		1,850	1,935		111,713
Oregon: Umatilla.	2,630	1,180	3,950		897	8,637												2,062
Oregon-California: Klamath.	1,775	4,468	100		1,894	8,237	239					239	39,094	30	110	524		39,758
South Dakota: Belle Fourche.	23,975		33,010	4,824	66,676	128,485							43,124		1,896			45,010
Utah: Strawberry Valley.	25,511	177,720	133,291		85,288	421,780	739	200			80	1,019	48,400	212	2,549	219		51,440
	19,009	10,660	50,640	525	199,920	281,360		426				426	35,895	302	1,460		2,343	40,000

Washington: Okanogan..... Yakima— Sunnyside division..... Tieton division..... Wyoing: Shoshone— Garland division..... Franke division..... Total.....	125..... 190,073 30,926..... 11,260 10,730..... 7,397 2,103..... 2,024 613..... 1,044,294	125..... 13,494 7,817..... 13,494 7,817..... 36,277 14,512..... 1,231,553	12,990 3,760,734..... 1,231,553	1,521..... 815,475 1,521..... 935,594	1,078..... 148,919 34,183..... 27,432 7,283..... 15,180	93..... 1,148 7,717..... 41 74..... 27,037	38..... 593 161..... 81 74..... 15,327	1,209..... 8,750 2,467..... 27,614 7,960..... 18,640
Fruits and nuts.								
State and project.	Apples.	Peaches.	Pears.	Prunes.	Citrus fruit.	Small fruit.	Miscellaneous.	Total.
Arizona: Salt River.....	Pounds. 899,600	Pounds. 58,800	Pounds 79,350	Pounds. 11,100	Pounds. 14,736,000	Pounds. 4,200,000	Pounds. 6,192,000	Pounds 25,148,000
California: Orland.....	13,864,200	347,000	240,000	5,040,000	216,000	59,100	346,460	812,560
Colorado: Grand Valley.....	Uncompahgre.....							939,600
Idaho: Uncompahgre.....								14,622,430
Boise.....								19,930,000
King Hill.....								1,121,530
Mindoka—Gravity division.....								710,200
New Mexico—Texas: Rio Grande.....								870,685
Oregon: Umatilla.....								657,625
Utah: Strawberry Valley.....								1,003,920
Washington: Okanogan.....								51,940,780
Yakima— Sunnyside division.....								109,315,045
Tieton division.....								81,895,095
Wyoing: Shoshone—Garland division.....								19,500
Total.....	228,695,670	19,243,950	18,639,370	9,051,900	14,972,000	11,832,720	6,551,360	308,986,970

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year." October, 1921, to September, 1922.  
<sup>2</sup> Wheat and oats.



Summary of crop reports on Government reclamation projects in 1922—Total yields—Continued.

State and project.	Vegetables and truck.				Miscellaneous.		
	Beans.	Onions.	Potatoes, white.	Potatoes, sweet.	Total.	Beets, sugar.	Cotton.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Tons.</i>	<i>Pounds.</i>
Arizona: Salt River.....	17,883		129,966		147,849		<i>Pounds.</i>
Arizona: California: Yuma.....							90,552,300
California: Orland.....							7,800,000
Colorado:							
Grand Valley.....	3,812		105,638		109,450		
Uncompagre.....	5,018	319,338	2,126,100		2,460,456	9,621	
Idaho:							
Bodea.....	605	26,250	3,480,000	410	3,507,265	7,639	
King Hill.....		108	112,223		112,426		
Mindota.....							
Gravity division.....	2,077	1,972	1,380,280		1,384,329	24,862	
Pumping division.....	82	650	2,201,125		2,201,827	28,167	
Montana:							
Hundley.....	839	626	20,218		21,682	34,900	
Milk River.....	365		26,227		26,692	17	
Sun River.....							
Fort Shaw division.....							
Greenhields division.....			51,266		51,266		
Montana-North Dakota: Lower Yellowstone.....			14,749		14,749		
Nebraska-Wyoming:			90,989		91,970	11,950	
North Platte.....							825
Interstate division.....	1,383	1,100	1,487,363		1,490,846	142,052	
Fort Laramie division.....	516	5,784	243,190		249,490	4,240	36
Northport division.....			5,879		5,879	6,669	
Nevada: Newlands.....			148,667		148,667		
New Mexico: Carlisbad.....				722	722		
New Mexico-Texas: Rio Grande.....				69,478	69,478	385	
North Dakota: Wulstons.....	13,168	10,594	33		93,273		
Oregon: Umatilla.....		2,100	10,540		12,640		
Oregon-California: Klamath.....			19,131		19,131		
South Dakota: Belle Fourche.....			38,255		38,255		
Utah: Strawberry Valley.....	50	30,270	30,320		30,320	3,145	
Washington:	594	1,967	79,706	300	82,567	46,615	
Okanogan.....			3,433		3,433		
Yakima.....							
Bumyside division.....	5,401	3,702	2,552,319	42,830	2,608,952	4,932	
Tieton division.....	5,383	11,360	339,825		356,538	706	
Wyoming:							
Shoshone.....							
Gardland division.....	492	762	547,448		548,692	10,720	
Framme division.....			39,091		39,091	548	
Total.....	58,689	388,367	15,295,941	113,440	15,854,367	846,627	13,474,500
							87,211,180
							6,698

Summary of crop reports on Government reclamation projects in 1922.—Total crop values.

State and project.	Cereals.					Other grain and seed.						
	Barley.	Corn, Indian.	Oats.	Rye.	Wheat.	Total.	Alfalfa seed.	Clover seed.	Sorghum (grain).	Flax seed.	Millet seed.	Total.
Arizona: Salt River.....	832,435	96,240	\$73,536	.....	\$916,410	\$1,028,621	.....	.....	.....	.....	.....	\$933,682
Arizona-California: Yuma.....	3,785	.....	.....	.....	21,416	25,201	522,400	.....	.....	.....	.....	614,525
California: Orland.....	8,273	.....	.....	.....	2,954	11,227	.....	.....	.....	.....	.....	98,725
Colorado:												
Grand Valley.....	.....	19,655	6,829	.....	24,353	50,837	7,340	.....	.....	.....	.....	7,340
Uncompahgre.....	1,596	39,585	58,445	\$65	179,572	279,262	5,421	\$1,994	.....	.....	.....	7,415
Idaho:												
Boise.....	71,738	160,420	42,438	969	707,020	962,583	29,081	291,816	.....	.....	\$181	321,078
King Hill.....	7,229	5,948	2,501	.....	3,375	11,953	3,881	.....	.....	.....	.....	3,881
Minnesota:												
Gravity division.....	26,780	44,072	43,844	21	231,262	335,949	2,940	39,930	.....	.....	.....	42,900
Pumping division.....	14,930	1,337	17,361	.....	212,951	246,779	336	34,120	.....	.....	.....	34,456
Montana:												
Huntley.....	3,147	6,775	26,900	38	100,320	137,180	168	3,850	.....	\$880	.....	4,018
Milk River.....	160	3,410	5,243	.....	21,322	30,135	2,522	.....	.....	.....	.....	3,702
Fort Shaw division.....	781	1,395	1,663	.....	7,625	11,464	.....	469	.....	.....	.....	469
Greenfields division.....	5,613	22,295	.....	.....	191,817	219,725	937	.....	.....	706	.....	1,643
Montana-North Dakota: Lower Yellowstone.....	1,064	11,192	11,448	.....	61,282	85,006	3,354	48	.....	496	.....	3,897
Nebbraska-Wyoming:												
North Platte:												
Interstate division.....	52,580	119,780	63,430	1,932	115,132	352,854	.....	1,610	.....	.....	259	1,969
Fort Laramie division.....	3,066	43,375	39,292	126	52,010	138,090	.....	.....	30	725	368	1,128
Northport division.....	7,086	8,817	3,993	.....	4,567	18,463	.....	.....	.....	.....	.....	.....
Nevada: Newlands.....	7,632	4,400	1,172	.....	60,400	73,604	.....	.....	.....	.....	.....	.....
New Mexico: Carlsbad.....	.....	5,701	.....	.....	15,652	11,353	25,355	.....	800	.....	.....	26,245
New Mexico-Texas: Rio Grande.....	6,163	203,905	16,961	.....	154,890	381,899	4,044	.....	2,891	.....	.....	6,965
North Dakota: Williston.....	1,315	472	1,362	.....	717	3,896	.....	.....	.....	.....	.....	.....
Oregon: Umatilla.....	1,562	3,842	60	.....	1,894	7,358	3,401	.....	.....	.....	.....	3,401
Oregon-California: Klamath.....	15,823	19,475	1,884	3,183	64,010	102,491	.....	.....	.....	.....	.....	.....
South Dakota: Belle Fourche.....	11,480	99,626	42,643	.....	76,759	230,408	7,242	1,800	.....	200	.....	9,242
Utah: Strawberry Valley.....	14,980	5,317	29,031	446	169,931	219,705	.....	2,130	.....	.....	.....	2,130
Washington:												
Okanogan.....	.....	168	.....	.....	.....	168	.....	.....	.....	.....	.....	.....
Yakima:												
Sunnyside division.....	6,756	133,051	8,231	589	155,467	304,094	.....	.....	.....	.....	.....	.....
Tieton division.....	7,511	24,740	4,300	.....	47,467	84,018	.....	.....	.....	.....	.....	.....
Wyoming:												
Shoshone:												
Garland division.....	3,699	810	18,139	.....	115,166	137,814	.....	1,552	.....	.....	512	2,064
Frankie division.....	1,032	245	7,256	.....	11,953	20,506	507	2,146	.....	.....	.....	2,658
Total.....	615,263	954,478	567,868	7,369	3,417,624	5,562,602	619,229	381,485	583,343	3,006	1,320	1,688,383

<sup>1</sup> Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1921, to September, 1922.

<sup>2</sup> Wheat and oats.





## CONTRACTS UNDER WARREN ACT.

## GRAND VALLEY PROJECT, COLORADO.

Name of contractor.	Date of contract.	Area in acres.	Amount of water.
No contracts during past year.			
Total from previous years (3 contracts) .....		18,400	<i>Second-fee.</i> 520

## UNCOMPAHGRE PROJECT, COLORADO.

Bell, John C. ....	Apr. 7, 1923	197	3.30
Donley, Fred. ....	Nov. 14, 1922	19	.31
Frasier, Frank F. and Erdie E. ....	Nov. 6, 1922	17	.29
Page, Mary A. ....	May 4, 1923	7	.16
Prottengeler, George S. ....	Mar. 24, 1923	10	.23
Simpson, Minnie Charlton. ....	Oct. 25, 1922	15	.26
Weber, Willis A. and George P. ....	July 3, 1922	45	1.00
Wilson, Laura Tilden. ....	Mar. 2, 1923	12	.20
Total. ....		322	5.75
Total from previous years (9 contracts) .....		640	11.30
Grand total. ....		962	17.06

## BOISE PROJECT, IDAHO.

Lakefork Reservoir Company. ....	June 19, 1922	12,500.00	<i>Acre-fee.</i> 18,000.00
Total from previous years (16 contracts) .....		212,960.44	330,847.35
Grand total. ....		225,460.44	348,847.35

## MINIDOKA PROJECT, IDAHO.

*American Falls.*

American Falls Reservoir district. ....	June 15, 1923	394,500	<i>Acre-fee.</i> 300,000
Empire Irrigation district. ....	do. ....	91,000	110,000
Total. ....		485,500	410,000
Total from previous years (24 contracts) .....		499,569	333,520
Total. ....		985,069	743,520
Less duplications. ....		279,500	143,250
Grand total <sup>1</sup> . ....		705,569	600,270

<sup>1</sup> Construction contracts not to be included in total, as no water delivered.*Jackson Lake.*

Murtaugh Canal Co. (assigned to Milner low-lift irrigation district) .....	July 29, 1922	10,000	<i>acre</i> 15,000
New Sweden irrigation district. ....	Sept. 26, 1922	23,000	12,500
Snake River Valley irrigation district. ....	Feb. 6, 1923	24,000	10,000
Total <sup>1</sup> . ....		57,000	37,500
Total from previous years (16 contracts) .....		626,840	502,000
Total. ....		683,840	539,500
Less duplications. ....		47,000	.....
Grand total. ....		636,840	539,500

*Temporary rental contracts, season of 1923.*

Hansten, Christian.....	July 1, 1922	100
Henderson, Arch.....	July 6, 1922	125
Idaho Falls, city of.....	Aug. 3, 1922	100
do.....	Aug. 12, 1922	50
Martin, Mrs. Wentla.....	July 12, 1922	50
Phillips, Thomas.....	July 20, 1922	55
Rowbury, W. H.....	July 24, 1922	50
Utah Power & Light Co.....	July 28, 1922	100
Vance, S. E., Jr.....	July 12, 1922	450
do.....	July 28, 1922	400
do.....	Aug. 3, 1922	300
do.....	Aug. 18, 1922	125
Total.....		1,905
Grand total.....	636,840	541,405

\* Contracts executed so late in season that only 7,000 acre-feet delivered. These contracts provide for use of Jackson Lake water pending completion of American Falls storage and the area and amount of water are included also in the data on American Falls storage.

## NORTH PLATTE PROJECT, NEBRASKA-WYOMING.

No contracts during past year.....		
Total from previous years (13 contracts).....	124,623	344,622.00

## KLAMATH PROJECT, OREGON-CALIFORNIA.

Malin irrigation district.....	Sept. 9, 1922	4,000.00	8,000.00
Shasta View irrigation district.....	Oct. 6, 1922	4,000.00	8,000.00
Horsefly irrigation district.....	Oct. 12, 1922	1,500.00	3,637.64
Sunnyside irrigation district.....	Oct. 24, 1922	789	1,578.00
Total.....		10,289.00	21,215.64
Total from previous years (6 contracts).....		48,377.74	
Grand total.....		58,666.74	

## BELLE FOURCHE PROJECT, SOUTH DAKOTA.

No contracts during past year.....		
Total from previous years (2 contracts).....	54.8	

## STRAWBERRY VALLEY PROJECT, UTAH.

No contracts during past year.....		
Total from previous years (8 contracts).....	29,060.00	22,135.00

## YAKIMA PROJECT, WASHINGTON.

Previous to fiscal year 1923.....		240,280.00	927,459.00
Benson, Trygve.....	May 7, 1923	10.00	30.00
Corrille, E. F.....	Apr. 30, 1923	10.00	30.00
Cronkrite, Owen B.....	Feb. 26, 1923	10.00	30.00
Fouquier, G. M.....	Apr. 23, 1923	10.00	30.00
Foster, Francis W.....	May 8, 1923	1.50	4.50
Granger irrigation district.....	Nov. 20, 1922	1,600.00	4,800.00
Irish, G. H.....	Feb. 27, 1923	10.00	30.00
Matteson, Rebecca B.....	Apr. 4, 1923	5.00	15.00
Morrison, W. J.....	Mar. 17, 1923	6.00	18.00
Stevens, J. E.....	Mar. 15, 1923	10.00	30.00
Thomas, Jesse W.....	Mar. 17, 1923	18.60	55.80
Zillah irrigation district.....	Sept. 29, 1922	108.12	324.36
Total.....		1,799.22	5,397.66
Total from previous years (15 contracts).....		240,280.00	927,459.75
Grand total.....		242,079.22	932,857.41



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U. S. DEPARTMENT OF THE INTERIOR

**ANNUAL REPORT OF THE  
COMMISSIONER OF RECLAMATION  
TO THE SECRETARY OF THE INTERIOR  
FOR FISCAL YEAR ENDED JUNE 30, 1924**



*U. S. Bureau of Reclamation*

DEPARTMENT OF THE INTERIOR  
HUBERT WORK, SECRETARY  
BUREAU OF RECLAMATION  
ELWOOD MEAD, Commissioner

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TWENTY-THIRD ANNUAL REPORT  
OF THE  
BUREAU OF RECLAMATION

Transmitted to Congress in pursuance of the  
Act of June 17, 1902 (32 Stat. 388)

FOR THE  
FISCAL YEAR ENDED JUNE 30, 1924



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1924

## LETTER OF TRANSMITTAL

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DEPARTMENT OF THE INTERIOR,  
BUREAU OF RECLAMATION,  
*Washington, October 7, 1924.*

THE SECRETARY OF THE INTERIOR.

DEAR MR. SECRETARY: The twenty-third annual report of the Bureau of Reclamation is herewith submitted.

The changed circumstances and needs of Federal reclamation have been discussed in the first pages of this report followed by a recital of the year's operations.

Respectfully,

ELWOOD MEAD, *Commissioner.*

II

*Dres (Aggr.)*  
*N. J. Public*  
 5-17-32  
 323219

# TWENTY-THIRD ANNUAL REPORT

OF THE

# BUREAU OF RECLAMATION

## GENERAL DISCUSSION

CHANGING CONCEPTION OF RECLAMATION.—INEFFECTIVE REMEDIES.—THE COMMITTEE OF SPECIAL ADVISERS ON RECLAMATION.—SUCCESS OF FUTURE PROJECTS DEPENDENT ON FURTHER LEGISLATION.—LEGISLATION RECOMMENDED BY THE ADVISERS.—FUTURE DEVELOPMENT MUST BE SAFEGUARDED AGAINST LAND SPECULATION.—MONEY MUST BE PROVIDED TO SUPPLEMENT SETTLER'S CAPITAL.—THE NEED OF A LONG-TIME PLAN FOR FUTURE DEVELOPMENT.—NEW PROJECTS REQUIRE EXTENDED INVESTIGATION.—PROBLEMS OF NEW PROJECTS.—THE ECONOMIC SURVEY.—GUERNSEY RESERVOIR, NORTH PLATTE PROJECT.—KITITAS DIVISION, YAKIMA PROJECT, WASHINGTON.—BAKER (POWDER RIVER) PROJECT.—OWTHEY PROJECT, OREGON-IDAHO.—VALE PROJECT, OREGON.—SPANISH SPRINGS EXTENSION, NEWLANDS PROJECT, NEVADA.—SALT LAKE BASIN PROJECT, WEBER-PROVO DIVISION.—CLASSIFICATION OF LANDS OF PROPOSED PROJECTS.—COMPLETION OF EXISTING PROJECTS.—A TENTATIVE PROGRAM IS AVAILABLE.—EXPLANATION OF PROJECT NEEDS.—LEGAL ACTIVITIES.—GOVERNMENT WATER RIGHTS.—TENANTRY.—CONTRACTS UNDER THE WARREN ACT.—DISPOSAL OF UNSUCCESSFUL PROJECTS.—OPERATIONS DURING THE FISCAL YEAR.—FINANCES.

## CHANGING CONCEPTION OF RECLAMATION

Discussions in Congress, official reports, and articles in the press, all bear testimony to the fact that a change is taking place in our conception of what is needed to make national reclamation by irrigation a social and economic success. All are agreed that a lofty purpose animated the framers of the national reclamation act; yet all familiar with its history realize that not all the conditions under which it would operate were foreseen, and that the results are unlike those anticipated.

When this act was framed the country was still in the pioneer period of development; irrigation works as a rule were neither large nor costly, areas watered from a single project were not extensive, and settlement of these areas shaped itself without organization or plan except in particular cases like those controlled by the Mormon Church. It was the common belief that all that was needed to obtain irrigated farms and prosperous homes was to provide water by building canals and reservoirs. The sponsors of Federal reclamation believed it would be a simple matter to change arid, unimproved land into farms because they thought the settler would have virtually free land, and that water would be cheap because the irrigation works would be constructed by the Government without profit, and with interest-free money.

As a result of this conception, the act dealt almost entirely with the construction and operation of irrigation works. The obstacles settlers would encounter in subduing the land, equipping farms, and meeting payments on water rights were not regarded as serious enough to require a place in the development program. Time has shown that this was a mistake. Land has not been free; a majority of the settlers had to buy their farms from private owners, in some cases at extortionate prices.

It is now known that the cost of changing 40 or 80 acres of raw land into a farm is not only much greater than was anticipated, but often equals or exceeds the cost of canals and reservoirs. It is beginning to be realized that development under important works

requires a study of agricultural and economic problems, and the working out of settlement and development plans if the land is to be brought under cultivation without disastrous delays and waste of money and effort.

In the 22 years of the act's operation social and economic conditions in the arid region have undergone a revolutionary change. People are no longer willing to undergo the hardships or privations that once were a part of pioneer life or adopt the methods which enabled pioneers to succeed when land was free, when they had no debts for land and very small payments for water rights. Even if they were willing, these methods will not answer to-day when the farmer has to pay higher taxes, pay the higher irrigation charges, pay more for improving farms, and too often pay high interest rates on money borrowed to buy or equip his farm. The financial problems of land settlement have assumed an importance which did not exist 20 years ago and which as yet is only partly realized.

### INEFFECTIVE REMEDIES

Because of the difficulties above enumerated, but without fully understanding their significance, Congress has from time to time passed laws, having as their purpose the relief of water users on Federal irrigation projects. The first of these laws was the Curtis Act of February 13, 1911 (36 Stat. 902). At that time public notices had been issued for 15 of the projects, which notices announced construction charges payable within a period of 10 years, as provided by the act of 1902. To a large extent, the farmers did not meet their payments and substantial delinquencies accumulated. A strong demand was made by them for the withdrawal of the public notices so as to stop the accruing of construction installments. The Curtis Act gave the Secretary a broad authority to withdraw these notices and to alter existing contracts. The authority of the act was utilized on all of the projects in question.

The concessions made by the United States under the 1911 act were held to be insufficient, and many requests were made for further deferments. As a result of this agitation, the extension act of August 13, 1914 (38 Stat. 686), was enacted, which doubled the length of time within which payment was required, making it 20 years.

Section 2 of the extension act required annual payments of 2 per cent of the construction charge for 4 years, then 4 per cent for 2 years, and afterward 6 per cent. Because of the inflation of the World War and the smaller payments that were at first required, no serious trouble concerning payments was experienced until 1920. Urgent appeals for relief, which then began coming in, have resulted in the passage of four temporary relief measures. The first measure is the joint resolution of May 17, 1921 (41 Stat. 4), the second, the act of March 31, 1922 (42 Stat. 489), the third, the act of February 28 1923 (42 Stat. 1324), and the fourth, the act of May 9, 1924 (43 Stat. 16).

The resolution of 1921 merely provided for the delivery of irrigation water without reference to delinquency. The three subsequent relief measures authorized delivery of water and also various deferments of charges. Under the relief act of 1922, 1,741 individual applications were received, and under the relief act of 1923 the applications numbered 3,239. The complete record for 1924 is not available at this writing.

This remedial legislation has not removed the troubles it was intended to cure. The deferment of charges does not touch the heart of the matter. The distressing symptoms of 1911 still obtain.

Enough experience has now been had to place reclamation on a permanent basis. The Government ought not to make contracts which water users can not meet and when they are made they should be enforced. Continued deferments or modifications of agreements will certainly lead to the belief that they are mere scraps of paper. Hereafter they should be regarded as binding obligations which must be faithfully observed.

### THE COMMITTEE OF SPECIAL ADVISERS ON RECLAMATION

These are the facts which give special significance to the appointment by the Secretary of the Interior of a committee of special advisers on reclamation<sup>1</sup> and make its appointment the most important event of our calendar in the fiscal year 1923-24.

This committee was asked to make an intensive study of the national reclamation policy, the law giving it effect, and its application under Government methods in reclaiming arid land by irrigation.

In his letter to the advisers the Secretary called attention to the fact that many original settlers had been compelled to abandon or surrender their farms after spending their capital and performing the hard and unprofitable work of development; that large areas of land, under some projects, were held by nonresident owners and cultivated by tenants in violation of a fundamental purpose of wise reclamation; and that the solvency of some projects was threatened by arrears of payments and by requests for postponement of charges, which would only augment the aggregate of debts already grievously burdensome. These things indicated that the Government reclamation policy had, in a measure, failed to accomplish the human and economic purposes for which it was created. The Secretary hoped that an intensive study of the causes of these conditions, by a group of trained men from different walks in life, would result in recommendations which, if adopted, would bring the program of the Bureau of Reclamation into harmony with existing conditions, would improve the finances of Government projects, and promote home ownership by people of small means.

The committee organized and began its investigations on October 15, 1923. Its report<sup>2</sup> was submitted on April 10, 1924, and was thereafter approved by the Secretary and the President, and transmitted to Congress.

Unfortunately, it did not reach Congress until near the end of the session. Time was lacking to give adequate consideration to all the committee's recommendations. A bill (H. R. 9559, sec. 5) having for its main purpose the financial relief of settlers on existing projects, has passed the House and is now before the Senate. This bill is based

<sup>1</sup> The committee consisted of the following: Thomas E. Campbell, of Phoenix, Ariz., former Governor of Arizona and president of the League of the Southwest; James R. Garfield, of Cleveland, Ohio, attorney-at-law, former Secretary of the Interior; Oscar E. Bradfute, of Xenia, Ohio, president of the American Farm Bureau Federation; Clyde C. Dawson, of Denver, Colo., attorney-at-law, and a director of the Chamber of Commerce of the United States; Elwood Mead, of Berkeley, Calif., engineer, professor of rural institutions of the University of California, and former chairman, California State land settlement board; and John A. Witdace, of Salt Lake City, former president of the Utah Agricultural College, and president of University of Utah.

<sup>2</sup> The report of the committee of special advisers on Reclamation was printed as Senate Document 92 of the Sixty-eighth Congress, first session. A limited number of copies are available on application to the Bureau of Reclamation, Washington, D. C.



on the committee's recommendations, but does not include some that are of fundamental importance to future development. If enacted in its present form it will authorize the following modifications in reclamation methods:

1. The annual payments on construction charges will be based on the average annual gross crop return; now they are based on a percentage of the project cost, fixed without relation to the productivity of the land.

2. Where lack of soil fertility, scarcity of water, or other adequate cause renders settlers unable to pay project costs, the Secretary may make such investigation as will disclose the pertinent facts and report them to Congress with recommendations, looking to a correction of the fault. The present law calls for repayment of project costs in full regardless of the value of the water made available for irrigation.

3. Operation and maintenance charges will be paid in advance, thus bringing Government practice in harmony with that of privately owned works. Such charges are now, for the most part, paid after the service is rendered.

4. The costs of the Washington office, including expenses of general investigations similar to the one undertaken by the committee, will be charged to the reclamation fund; but not to the water users as at present.

### **SUCCESS OF FUTURE PROJECTS DEPENDENT ON FURTHER LEGISLATION**

All the foregoing changes will be helpful in the operation of existing projects, but if legislation stops with these the amended reclamation act will not provide a working plan for the development of new projects. The reason for this is the fact that many of the best opportunities for future reclamation are where the land is now privately owned. Under the grazing homestead act filings have been made on virtually all the land which can be irrigated, and much of this land is held in areas larger than homestead units and by people who have no intention of becoming irrigators if works are built.

Although private land projects may be taken up and constructed by the United States under the Reclamation Act, it was never the purpose of that act to subsidize private owners by furnishing interest-free money to develop their excess land holdings, leaving them free to capitalize the Government's investment in reclamation works and add it to the price at which they sell their excess holdings to actual settlers. Nor was it the intention to improve arid estates by supplying water and then leave the owners of those estates to create a system of tenantry and rent the land on an irrigation basis.

Yet the law in its present form is conducive to both of these things and both have happened repeatedly. Lack of adequate authority has prevented the Bureau of Reclamation from adopting a coordinated or orderly subdivision and settlement of these privately owned properties. In too many cases high prices asked for land, held in large tracts before the Government works were authorized, have retarded settlement and agricultural development, have increased tenantry, and made the act an instrument for creating poverty among oversanguine and inexperienced farm buyers.

**LEGISLATION RECOMMENDED BY THE ADVISERS**

The evidence of the benefits of a coordinated plan of settlement was so convincing that the committee of special advisers sought to provide this. It proposed what seemed to it the only effective means, which was that the Government buy or secure absolute control of all the privately owned land held by any individual in excess of a homestead unit before works are authorized or development begun.

Recommendation No. 12 deals with this subject, was embodied in section 3 of a draft of a bill that accompanied the committee's report, and reads as follows:

12. *Disposition of private lands in excess of farm unit.*—That no reclamation project should hereafter be authorized until all privately owned land in excess of a single homestead unit for each owner shall have been acquired by the United States or by contract placed under control of the Bureau of Reclamation for subdivision and sale to settlers at a price approved by the Secretary. This price to be considered in determining what land and water will cost settlers and hence the feasibility of the project under the payment conditions of the law.

This was opposed by some who do not realize the difficulties in obtaining settlers under existing projects, public or private, and by others who regard land speculation as a legitimate feature of reclamation. Still others believed that the purchase of the land would involve too large an investment of money in a single project and would increase the complications of reclamation. For these reasons this section of the bill was omitted from the measure now before Congress.

If, however, control of settlement were made possible the bureau could go ahead with development, certain that the future settler could get his farm at its actual value. It could proceed to subdivide excess lands into farms of proper size, could adjust the prices of land to agree with productive values, and could give long-time payments with low interest. If the Government owns or controls the land in excess of homestead units, it can properly give liberal terms to farm buyers and make it possible to obtain settlers with small capital, but equipped by character and experience to succeed. In other words, if plans for settlement and farm development are made a part of reclamation the policy will be complete instead of stopping as it now does where engineering ends and agriculture and human welfare begin.

The Advisory Board framed other recommendations to accord with this governmental control of excess land. One of the sections of the act provides that under new works construction charges would not be imposed until a period varying from one to five years after water was ready for irrigators. This is a desirable feature for harassed settlers trying to improve and equip farms, but it will open the way to abuses if it is to apply to excess holdings owned by individuals.

Taking part of the advisory board's legislation recommendations and rejecting part, creates an unworkable plan. It is useless to apportion construction costs carefully if the owner of large project areas ignores these in fixing selling prices of lands to settlers. To let the owner of large holdings escape any payment of project costs for one year or five years, as is provided in Subsection E of the bill now before Congress, and thus hold on to the land while asking excessive prices, is an abuse which will delay development and jeopardize some of the most beneficent possibilities of the act.

## **FUTURE DEVELOPMENT MUST BE SAFEGUARDED AGAINST LAND SPECULATION**

The evidence placed before the Advisory Board was conclusive as to the need for safeguarding future development against the evils of land exploitation. The reports of the central cost review board of 1915-16 repeatedly called attention to these abuses. A quotation from one of these reports reflects this conclusion:

It (the board) believes there are a small number of water users who are having a hard time, and who have our sympathy. But their plight is not due to high charges for water or threatened project costs. The evils of this project are inflated land prices, high freight charges, high interest rates, alien landlordism, a nominal and not actual compliance with the regulations fixing the size of farm units that closely verges on fraud. Agricultural methods are poor because so much of the land is farmed by tenants, who have no reason to make improvements, nor money or equipment needed to cultivate this land as irrigation requires. All these malign influences are back of the efforts to reduce project costs. (Reclamation Record, July, 1916, p. 299.)

Unless the law is changed there is no reason to anticipate better results in the future. On new projects some landowners will look to reap advantages from sales of land to settlers at inflated prices rather than from an increase in earning capacity.

If irrigators have to buy their farms from these owners what will they be asked to pay for land on one area where competent opinion fixed the value of land at \$5 an acre? One owner said his price was \$50 an acre. He believes that he can get \$45 an acre rakeoff as his part of the benefit of Government construction. He sees nothing wrong in this. Nevertheless the wrong and the injury exist. Money that ought to be spent on improvements would go to make inflated land payments. The field officers of the Bureau of Reclamation would face the heartbreaking experience of seeing settlers work under conditions so discouraging as to give almost no hope of success.

## **MONEY MUST BE PROVIDED TO SUPPLEMENT SETTLER'S CAPITAL**

Nowhere is early and successful closer settlement more important than under Government projects. On all new projects under consideration the existing population must be largely increased if the best results are to be obtained from the cultivation of the land, but it is becoming increasingly difficult to secure settlers equipped with means to develop homes on these new projects. A number of States realizing this have either enacted laws providing financial assistance to group settlement or are considering doing so.

The prospect of settling in an undeveloped territory, where there is lack of social advantages, public improvements, roads, schools, churches, and amusements, where taxes are high and where the neighborhood conditions are unknown, does not appeal to people who are able to buy farms without borrowing. It will, therefore, be necessary to scale down the financial requirements of settlers to the very minimum, which will result in hardship and slowness of development unless some means is provided for supplementing the settler's capital. A suitable credit fund, wisely administered, would do much to alleviate distress and, in many cases, avoid insolvency. Unless this is done, settlers will have to face high interest rates, difficulty of borrowing the money needed to bring their farms under cultivation,

and the risk which attends loans made under unsatisfactory conditions. Believing that the creation of such a credit fund would be the most effective means of enhancing the human values and the economic benefits of Federal reclamation, the advisory committee reported in favor of such a fund in recommendation No. 31, which reads as follows:

31. *A credit fund for farm equipment.*—Project settlers are in need of relief from paying high interest rates on short-time loans. They are often unable to borrow money with which to improve and equip their farms. A credit fund should be provided under competent control, from which settlers on the projects can borrow money with which to make permanent improvements or to buy needed equipment and livestock. Loans for permanent improvements, secured by the land, should run not to exceed 30 years; loans for equipment and livestock not to exceed 5 years. The rate of interest should be 5 per cent; payments of principal should be amortized; the making or refusing of loans should be at the discretion of the credit authorities.

### THE NEED OF A LONG-TIME PLAN FOR FUTURE DEVELOPMENT

It has been found expedient in past development to suspend engineering construction on certain projects until settlement and agricultural development had utilized the portion already built. This leaves a number of projects only partly developed. The time seems to have arrived when their completion should be given careful consideration and a long-time program of development worked out. The need for doing this arises from the fact that the completion of these projects will make a serious inroad on the reclamation fund for the next 10 years, and will have a vital relation to the adoption of new projects. This relation of old development to new needs to be carefully considered because the reclamation fund has drawn heavily from resources within some of the western States that have received comparatively little in return. In some States irrigation is the only hope for further development; in some localities irrigation development will help to open mines and secure railways and factories. These States will press for new projects or arrangements that will insure future construction. What is needed, therefore, is a program of development which will fix the location and order of construction of new works for a number of years.

There is need also for a study of the relation of Federal reclamation to irrigation development being carried out under State laws. There are many unfinished private projects and there is the question of what should be done under irrigation district laws with their provision for the issue of tax free bonds. In recent years the construction of works under these acts has proceeded quite rapidly, especially in California and Oregon, but many of these projects have proved financially unprofitable. In some cases money to complete development can not be secured. There is a tendency or temptation to look to the reclamation act as a life-saver for these dubious enterprises. All of these things emphasize the need for a definite program of development.

If an attempt is made to look ahead, the question will arise whether States or localities having a special interest in irrigation projects should not contribute a part of the cost aside from that paid by the settlers. There are a number of reasons for enlisting State cooperation and State aid in the settlement and agricultural development of

projects. The State has an even greater interest than the Nation in character of the people who make homes on this land. The quality of schools, the building of roads, the support of churches, intelligent decisions of public questions in elections, and things that minister to the higher life of communities all depend on the character of the settler. The foundation of the State's future civilization is laid in these new communities. Rural development of States would be promoted if aid in colonization and agricultural development could be decentralized with the State having a direct participation in the selection of settlers and the development of farms.

No one can study the conditions of the arid States and the manner in which reclamation is destined to influence their growth and prosperity, without realizing that what is needed is a program for future development which will be planned to extend over two or three decades. The final authority which determines what shall be done is Congress, and if arrangements could be made by which Congress could create some permanent joint committee which could cooperate with the States in fixing the spheres of State and Federal activity and determine what each should do, such a joint committee or commission would have great influence in clearing up the complex situation which now exists with regard to the amount of unappropriated water available for either industrial or agricultural development and avert destructive conflicts which are likely to arise if the present development continues. Not only are there controversies between States over the use of water for the same purpose, but there are contests between rival interests seeking control of streams for irrigation or for the generation of hydroelectric power. These tend to impair the security of large investments of money in industrial enterprises and the permanence and value of many farm homes. As population increases the demand for water will increase in like measure. Only public control based on a careful study of all the rights and interests involved can avert wasteful development and conflicts of interests that will be a menace to social and industrial progress.

It is hoped, therefore, that such action may be taken by Congress as will result in a thorough investigation of the unused agricultural resources of the West, the water laws which affect that utilization in the different States, and the working out of a program of reclamation and power development affecting the whole arid region and extending over a long period of years. Whatever information is needed could be gathered by the bureau and by the irrigation authorities of the different States. The labors of this committee could not fail to be of great value.

### NEW PROJECTS REQUIRE EXTENDED INVESTIGATION

Under present law Congress allots the reclamation fund and thus decides when and what new projects shall be adopted, but the law likewise contemplates a recommendation by the Secretary of the Interior after investigation by the bureau under him. For the benefit of Congress and the department there should be complete investigation of irrigation projects before decision is reached to develop them at the expense of the Federal reclamation fund. This involves a number of phases. Engineering studies are necessary to determine the physical availability of land and water, the feasibility of con-

structing the necessary reservoirs, canals, and other works, and to provide an estimate of their cost. Legal questions regarding the water, the practicability of acquiring the necessary rights and arrangements with landholders should be covered with equal care. Of equal or even greater importance than engineering and legal phases of new projects there should be studied their agricultural possibilities. There should be determined in advance the cost of developing a farm to a point where full production can be realized and the value of the irrigation water in farming the lands, which should be classified in accordance with their ability to produce and to repay the irrigation costs.

The projects already developed include more private than public land and new projects will largely be for the irrigation of lands that have already passed into private ownership. In many cases virtually the entire area will be private land. Before the United States spends money for the development of such lands complete arrangement should be assured that the enhancement of their value will not enter the pockets of speculative holders and be added in selling prices to the burdens assumed by the actual settlers and cultivators. Arrangements, vital to successful development, will provide for the acquisition by the Government of excess holdings, their subdivision and disposal to home-making settlers at reasonable prices.

### PROBLEMS OF NEW PROJECTS

In April, 1924, Secretary Work submitted to the Bureau of the Budget estimates of appropriation for commencing construction of important irrigation works on six projects. Three of these were new projects designated as the Salt Lake Basin in Utah, the Vale in Oregon, the Owyhee in Idaho and Oregon. In the three other cases the proposed works were related to projects already in hand including a reservoir at Guernsey, Wyo., on the North Platte project, a reservoir at Spanish Springs for the benefit of the Newlands project, in Nevada with canals for new lands adjacent, and the Kittitas division of the Yakima project in Washington which will bring the distribution facilities into harmony with the storage recently enhanced by construction of the Tieton Reservoir.

These budget estimates dealt with construction costs. The engineering features of these proposals have been investigated over a period of years and were well defined. The appropriation suggested approximated \$6,000,000, but the works contemplated would cost in excess of \$50,000,000.

### THE ECONOMIC SURVEY

- The appropriation estimates did not deal with the problems and expenses of land settlement or agricultural development. The advisory board, showing conclusively that solvency of any reclamation project depends largely on the fitness of settlers and earning power of land, recommended agricultural and economic investigations of all future projects before development. The Secretary directed that such investigations be made of all these proposed developments and that a further economic survey be made of the Baker project in Oregon because its feasibility had been questioned following a report prepared by the United States Department of Agriculture.

These economic surveys have been organized to determine the productive power of the land and what farmers can afford to pay

for water, to determine the size of farms and the amount of money needed to improve and equip them for irrigated agriculture, to fix the areas of land in public and private ownership and the settlement policy needed to secure prompt development and return of construction costs. The plan followed was to secure the aid of agricultural and economic experts from the agricultural colleges of the States in which the projects were located, men with technical training and a knowledge of local conditions. The cooperation of the State agricultural colleges of Utah, Nevada, California, Oregon, Washington, and Idaho made this possible. In addition, soil experts from the Department of Agriculture and engineers from the Bureau of Reclamation took part in these studies and rendered valuable assistance. After the technical studies were completed and conclusions reached, the reports were submitted to a group of local bankers and business men for comments and criticisms on matters about which they have practical knowledge, such as the acreage value of crops grown, the cost of improving and equipping farms, the credit settlers will need, and the construction cost they can afford to pay.

In inviting these expressions from local people it was realized that there might be a bias in favor of development, which would tend to make statements too favorable, but against this there is the fact that all who participate in these studies become in a sense responsible for the results if the project is approved by Congress. That these investigations have been entered upon with a full sense of this responsibility is shown by the following quotation taken from a letter of one of the investigators:

I have insisted with my colleagues in the State, during the time we have been working on this matter, that we must not, under any conditions, make any recommendations for projects or parts of projects that are not financially sound. While we have great need of water, we also have a reputation to preserve.

The importance of these investigations has been greatly increased by the changes wrought in rural conditions by the Great War. The cost of everything that enters into the construction of irrigation works and into changing raw land into irrigated farms has been greatly increased. This means there is less margin between outlay and income and greater need to guard against mistakes and waste.

The return of the Government's investment must come from the sale of irrigated crops, and where irrigation works are not followed promptly by settlement and irrigation of the land, either the Government is not paid, or the land becomes a financial burden to its owner. Along with plans for construction should go plans for the subdivision and settlement of the land. The greater the construction cost, the more important it is that plans for settlement and farm development be carefully thought out. Hereafter, more attention must be given to the questions where and how settlers are to be secured, what improving and equipping a farm will cost, and where the money for this development is to come from.

The six projects being investigated illustrate the complex business and social conditions under which Federal reclamation has to operate. These influence the feasibility of projects and the welfare of settlers. They should shape the methods and policy of this bureau. The reasons for this will be made apparent by the explanation of the present economic conditions on the areas which it is proposed to reclaim and develop.

**GUERNSEY RESERVOIR, NORTH PLATTE PROJECT**

Additional water storage and regulation will be required for the North Platte project before all the lands of the Interstate, Northport, and Fort Laramie divisions can have a full water supply. There is a good reservoir site in Wyoming on the North Platte River about 160 miles below Pathfinder Reservoir and 10 miles above Whalen Dam, the diversion for the North Platte project. The two main functions of this reservoir will be to regulate the use of water turned out at Pathfinder Reservoir and catch the run-off entering the river between Pathfinder and Guernsey. A subordinate use will be power development.

The storage capacity of the site is 72,700 acre-feet. It is estimated, on the basis of past records, that it will store annually about double the above amount. The dam site is in a canyon. The dam will be 97 feet high above river bed and its top length 575 feet. It will have a gravel and rock fill embankment and faces riprapped with rock. The total quantities in the embankment will approximate 500,000 cubic yards.

Although the North Platte project has favorable agricultural conditions the financial situation of its farmers is serious. This menaces payments of construction and other charges due the Government. Much of the land is heavily mortgaged, payments are overdue, and farmers work under dread of foreclosure. This is not the result of Government operation. The settlers lacked capital to pay for and improve their farms. They had to borrow at high rates of interest, 8 and 10 per cent, and on short-time notes. Foregoing payments to the Government will not pay the private debts. Some means is needed of refinancing them, of refunding these debts at 5 per cent on 20 to 30 years amortized payments.

The debts due the Government on land north of the river are fixed by numerous contracts under the reclamation act or the Warren Act with individuals, companies, or irrigation districts. On the south side the expenditure and arrangements for its return are less advanced. These additional contracts for repayment of project costs should be made before the next irrigation season begins.

The main canal of the Fort Laramie division runs through a broken and difficult country. Its construction has been expensive and project costs will be high. This would not be a reason for any anxiety if the land was subdivided into proper farm units and improved for intense culture under irrigation; with a few exceptions both of these things remain to be done.

On the west end of this division tenancy has to be dealt with. A part of this was public land with here and there large stock ranches privately owned. The public land was thrown open to entry in 80-acre units, preference being given to soldiers. At one of the openings 3,300 individuals applied for 80 of these, an average of more than 40 applicants for every farm. If the law had permitted a scrutiny of settlers' qualifications and a selection of those best fitted for this development there is no doubt that from this number 80 real farmers could have been chosen. Instead of this, the farms were drawn by a lottery. Too many "winners" were artisans or business men in near-by towns to whom a gift of 80 acres of land looked attractive. A majority lacked money and experience. Few realized what they must do to meet their obligations to the Government and what it would cost to prepare these farms for irrigated culture.



What most of them did was to put up rough-board and tar-paper shacks, often without a floor, and doing that exhausted their capital. Then the land was rented. Of the 80 farms, 68 are now being cultivated by tenants and of these tenants 55 are aliens. What should be done is a serious question. If the purpose of the reclamation act is to be fulfilled, then tenants ought to be replaced by American farm owners.

The farmers on the eastern end of the Fort Laramie division are heavily in debt. Some of the land has been taken over by banks and mortgage companies. There are dry farms of over 1,000 acres which need to be subdivided. How and where are the purchasers for these surplus lands to be found? It must be done if the money to meet project costs is to be paid out of crops. Already requests have been made to have project costs cut down and to have payments postponed until interest-bearing debts can be reduced.

### KITTITAS DIVISION, YAKIMA PROJECT, WASHINGTON

#### ENGINEERING FEATURES

This division is located in the vicinity of Ellensburg, in the State of Washington. It contains about 70,000 acres of irrigable land. The water supply will be obtained from the natural flow of the Yakima River and from storage reservoirs already constructed. The irrigation plan contemplates the construction of a diversion dam on Yakima River about one-half mile above the town of Easton. The Main Canal runs on the south side of the Yakima River for about 27 miles and the North Branch crosses the river and runs around the north and east sides of the valley, finally reaching the river 6 miles south of Ellensburg. This branch is 50 miles long. The South Branch extends from the end of the Main Canal for a distance of about 14 miles. The capacity of the Main Canal varies from 1,000 to 840 second-feet; the North Branch from 675 to 35 second-feet, and the South Branch from 160 to 16 second-feet.

There will be seven siphons, one tunnel 1,010 feet, and two wasteways on the Main Canal. The Yakima River is to be crossed by a siphon 5,158 feet long and 12 feet in diameter, with a maximum head of 305 feet. There will be four tunnels on the North Branch Canal with lengths of 1,795 feet, 1,600 feet, 1,995 feet, and 2,670 feet. Six siphons and four wasteways must be provided. On the South Branch Canal there are two siphons and one tunnel.

The recommendation for the construction of the Kittitas division of the Yakima project by Secretary of the Interior Work was based on a favorable report of the chief engineer, which estimated its cost at \$8,125,000. A portion of this sum, estimated to be \$1,710,000, is the cost of storage and surveys already incurred. The construction of this division will utilize the Tieton Reservoir which, without such development, will remain a frozen asset.

The engineering report fixed the approximate acre-cost of water but did not deal with the agricultural and economic conditions which would determine the value of water or the expense of changing this area into a section of small improved farms. In order to gather additional data a committee was appointed in June, 1924, to make an agricultural and economic survey of this project. The members.

of this committee were Prof. C. F. Shaw, soil technologist, University of California; B. E. Hayden, industrial agent, Bureau of Reclamation; and Prof. George Severance, specialist in farm management, College of Agriculture, Pullman, Wash. The committee was assisted by L. T. Jessup, drainage engineer, Bureau of Public Roads, and Henry Holtz, soil physicist, Agricultural College, Pullman, Wash. The report will be reviewed by a local committee of bankers, farmers, and others consisting of Marvin Chase, State hydraulic engineer, J. Davies, Bruce Bonney, George Snodgrass, P. H. Adams, John N. Faust, F. C. Schnebly, and Frank Edes.

#### AGRICULTURAL CONDITIONS

The land in this division lies above and partly surrounds a body of irrigated land which has an established agriculture consisting of meadow grasses, alfalfa, clover, timothy, and grain. The soils are thin, yet the tonnage of hay is satisfactory and the yields of grain are exceptionally high. This is a hay and grain region. The returns from these farms give a good basis for estimating the returns from the lands proposed to be irrigated.

Of the area 6,626 acres are public land and 79,344 acres are owned by individuals and corporations in areas varying from 20 to 800 acres, but usually in tracts of 80 to 320 acres. The Northern Pacific Railroad Co. owns 5,242 acres and the State of Washington 1,847 acres. Because of the large percentage of land in private ownership the arrangements for administering this project have included definite agreements as to the price at which areas in excess of homestead units are to be sold. Soil, climate, and the kind of crops grown indicate that farm units should be from 20 to 160 acres each. The Kittitas division will require approximately 500 new settlers to fully utilize the land and bring it under successful cultivation.

The Northern Pacific Railroad Co. has been asked to fix a price on its lands. It is understood the company will agree that its lands shall be sold at such a price and on such terms as will be to the best interests of a planned development. The portion of the Kittitas division which is partly improved and partly irrigated could for the present be left to its owners to develop under the contract now being drafted by the Bureau of Reclamation.

The benefits to come from this development and the prompt repayment of project costs will be influenced by the measures taken to secure settlers. On the land in private ownership this task can be left to the landowners, although a coordinated plan for the colonization of surplus lands will be a valuable help. On the public and railroad land something more is needed. Everything combines to make this project an attractive place to test our methods of settlement similar to those employed in other irrigated countries. This demonstration, if made, should utilize the unimproved land in Badger Pocket and immediately east of it. It has an area of about 12,000 acres. It is remote from towns and separated from the settled and improved sections of the project. The land has an irregular surface, a part having steep slopes. This unimproved tract is unlikely to attract settlers when improved lands can be bought elsewhere on favorable terms.

To overcome these obstacles and prevent a costly delay in development the following things should be made a part of the preparation for settlement:

The rectangular Government surveys should be abandoned and farms laid out to fit the ditches and drainage channels, and also fit in with a carefully planned irrigation layout, which will minimize the difficulties of irrigation and at the same time add to the convenience of cultivation. Farm units in this part of the project should vary in size from 20 to 80 acres, to fit the topography of the country, the productiveness of the soil, and the capital and skill of settlers. The settler with children can utilize more land than one without such help who desires to specialize.

The plan also should include homes for families who expect to make the greater part of their living working for wages. Their holdings should vary from 2 to 5 acres, and should be in groups of about 10, where a common domestic water supply and other civic improvements can be shared by them. There is need for these workers and a good prospect of employment. The farm worker will need little capital if he can be helped with his house. The products from his few acres would provide much of his food supply, thus allowing much of his wages to go into improvements or savings. On the State land settlement at Durham, Calif., and in foreign countries, these workers' homes have demonstrated both the social and economic value of the idea.

Before the land is thrown open to settlement it should be cleared of sagebrush and a part planted to alfalfa, clover, or irrigated pasture. Practical farmers state that by using a power drag and doing this work before the erection of fences, the cost would be reduced about one-third. Preparatory work will give settlers more time to house their families, erect fences, get their stock and improvements together, and insure a crop income the first year.

A practical business superintendent with a knowledge of farm conditions should be employed to plan settlement and advise settlers in the selection of a farm suited to his capital, labor, and experience, and in making out a tentative program of development. This is a valuable service. It would include gathering information for settlers as to where horses, cows, and other livestock, building materials and implements, and other things necessary for farms can be acquired.

With the high irrigation costs to repay, settlers should be given liberal terms on the costs of the farms themselves. Farms should be sold to settlers on long-time amortized payments. Settlers should pay 5 or 10 per cent of the cost as an initial deposit and the balance repaid over a period of 20 years. The interest recommended is 5 per cent and the yearly amortized payments on principal 3 per cent. With such yearly payments the settler would be relieved from the fear of mortgage foreclosure and be adding each year to his equity in the property.

Farms should be valued according to location, quality of soil, and ease or difficulty of irrigation. A map should be prepared showing location of farms, valuation of each, and such information as would enable intending settlers who have not seen the area to know the reason for these prices.

An application blank should be prepared. This should state the applicant's past experience, his capital and other qualifications, and

the kind of farming he desires to follow. The opening should be advertised in State papers and in the localities from which desirable settlers would most likely be secured. The date for considering these applications should be not less than 30 days after the land is thrown open for inspection. At least two local men should sit with a representative of the bureau in dealing with these applications, and in interviewing applicants where there is more than one for a single unit.

The capital of settlers should vary with the size of the farm, and for a 40-acre farm should not be less than \$1,500. Farm laborers could be accepted without capital provided they could make the initial payment on the land and furnish 40 per cent of the cost of their dwellings and other necessary improvements. For settlers lacking money to improve their farms there should be advances of part of the cost, but so handled that it would be a service rather than a loan. Some of the very best farmers will not have money to make their farms going successes. This credit fund should be administered by the bureau, with a local advisory board.

The advantage of such advances has been tested out in many countries and is therefore by no means experimental. It is safer than the investment in canals, and will do more than is now realized to promote the repayment of project costs. Many countries have placed a limit of \$2,500 to \$3,000 per farm on such advances. Money advanced on farm improvements should bear 5 per cent interest, and the period of repayment should vary from 3 to 20 years. A 20-year loan on permanent improvements would cost the settler 8 per cent per annum, 5 per cent being interest and 3 per cent applied on principal. The money will not be loaned in the ordinary way, but will be advanced only to help pay for things needed. The following is an indication of what will be required to change sagebrush land into farms in the Kittitas division. These amounts will vary with the cost of preparing land for irrigation:

60 acres, at \$10 an acre .....	\$600
Clearing 60 acres, at \$5 an acre .....	300
Leveling and ditching, 40 acres, at \$25 an acre .....	1,000
Small house .....	750
Barn wing .....	400
Fences .....	250
Domestic well and pump .....	100
Team, plow, wagon, harrow, mower, rake cultivator, corrugator, harness, and small tools, about .....	800
Cows and chickens .....	125
Total .....	4,325

If nothing is done to prepare farms, the settler must live off his capital for at least one year, which would amount to \$600. Water charges, taxes, fire insurance, seed, labor, and miscellaneous items will absorb another \$1,000, making the total cost of the undertaking \$5,925. A settler with less than \$5,000 would become hopelessly involved unless land preparation, credit, guidance, and advice formed a part of the program.

If the farms are sold to the settlers on the terms described, 40 acres prepared and seeded to crops in advance of settlement, and loans made amounting to 60 per cent of the value of improvements, the farmer

can start safely with an initial capital of \$2,000 to \$2,500. Settlers can be accepted with a cash capital of \$1,500 provided they are loaned \$3,000.

To settle 12,000 acres, in 50-acre farm units, would require a revolving fund of approximately \$500,000. The inclusion of this feature will add less than 10 per cent to the money invested in the project.

The land should be thrown open in 5,000-acre tracts to insure complete compact settlement. This would give the superintendent an opportunity to help the settlers secure livestock, plan their buildings, and obtain the things needed for development without the confusion and loss which might result from throwing the whole area open at one time.

### BAKER (POWDER RIVER) PROJECT

The Baker project, located in northeastern Oregon, was first investigated by Consulting Engineer Jacobs, of the Bureau of Reclamation, in 1908, and included at that time 27,000 acres. It was undertaken as a Carey Act project by the Powder Land & Irrigation Co., which proposed the reclamation of 65,000 acres.

A report was made on the project by Engineer C. C. Fisher in April, 1922. A board of engineers consisting of James Munn, J. L. Savage, and C. C. Fisher reviewed the report in January, 1923, and in November, 1923, a report was made on the agricultural and economic phases of the project by officials of the Department of Agriculture. This report raised a question as to the financial feasibility of the project under the existing reclamation laws.

Because of this and the importance attached to the agricultural phases and pending legislation, a new economic survey was ordered in June, 1924. The investigators were M. H. Lapham, soil technologist, Bureau of Soils; G. R. Hyslop, professor of farm crops, Oregon Agricultural College; G. C. Imbrie, assistant engineer, Bureau of Reclamation; and Geo. C. Kreutzer, director of farm economics, Bureau of Reclamation. They were instructed to review the conditions that affected the solvency of the undertaking and the modifications of the boundaries of the district. Their report is to be reviewed by a local committee of bankers and farmers consisting of William Pollman, T. G. Montgomery, F. A. Phillips, W. A. Stewart, all of Baker, Oreg. The conditions which will confront these investigators are as follows:

The irrigable area of the project is 26,931 acres, of which 45 per cent, or approximately 12,119 acres, is public land and 14,812 acres are owned by 61 individuals in areas varying from 40 to more than 1,000 acres.

Owing to the elevation, which is 3,000 feet, agriculture will be restricted to crops which will mature in a short-growing season. These crops can be best utilized by feeding them to dairy cows, hogs, sheep, and poultry. The income may be supplemented by growing cash crops of clover and alfalfa feed and other specialties. The farm units should be moderate sized, varying from 60 to 80 acres. Commercial fruit production is unlikely, owing to shallow soil and to frosts.

The topography of the country is broken, with steep hillsides. The benches are rather smooth, but the soil is shallow. On the hillsides the soil is deeper, and with careful irrigation will produce larger

yields than much of the bench lands. The cost of canals and reservoir needed to supply water to the project will be approximately \$4,-000,000, or about \$160 an acre.

To meet these conditions the Baker project should be settled by men of experience, who possess or can obtain sufficient capital to clear the land, plant it to irrigated crops, and bring the farms to full production soon after the canals and ditches are completed. It is difficult to conceive how this can be brought about without some plan that will go further than anything in the past. To purchase 60 to 80 acres of land, even at the low cost of \$5 an acre, plant it to irrigated crops, equip the farm with stock, implements, and buildings, and erect a small cottage of moderate cost will require a capital of \$5,000 to \$7,000. When the chances of obtaining settlers with that much capital are considered, it must be realized that well-improved irrigated land, fenced, equipped with buildings, and growing crops can be purchased in many of the Federal and private projects of the Northwest for \$150 an acre, including a paid-up water right.

Unless development goes further than the mere building of canals, and unless aid in improving farms similar to that outlined for the Kittitas division is incorporated in the settlement of the public lands, then it is not believed that suitable settlers with capital can be attracted in sufficient numbers to settle the project in a reasonable period of time. Slow settlement means a delay in the payment of the Government's investment and a possible deficit in operation and maintenance expenses.

Calling attention to these difficulties and the necessity for alleviating them is not intended to condemn the project. The lands of the Baker project are reasonably fertile and can be made to produce a gross annual return of \$30 an acre. The project is suited to diversified farming and a prosperous dairy industry can be built up. It is highly suited to the production of clover and alfalfa seed and other specialties. The first thing needed is to convert some of the steeper sagebrush land into fields of alfalfa, clover, and irrigated pasture. It will serve not only as a demonstration of what can be done, but will give the new settler feed for his stock and a return the first year instead of waiting until the second or third year for this return, as is usually the case under unplanned settlement. This need be done only as fast as settlement demands it. A settler buying a farm, of which one-half is already producing, will know what can be done and will have the satisfaction of earning money from the land as soon as he takes possession.

Since agriculture probably will be built around the dairy industry, the settler will need cows, a small barn, a few breed sows, implements, and a dwelling. Clearing, leveling, and seeding to crops probably will cost from \$25 to \$40 an acre. This can be done by the Government and turned over to the settler at cost, a portion of which should be paid in cash and the balance on terms with 4 per cent interest. The settler will need some advances to complete the development of his farm.

With these things provided, many men with small means, who can not purchase farms elsewhere, will become purchasers of these lands and the project should be settled in a reasonable time. The total additional cost to the Government of providing these things will be not more than \$40 an acre, or \$3,000 a farm. In some cases

less will be needed. The reasons that justify providing money for farm development at Kittitas apply with greater force to the development of the Baker project. It is recommended that the 14,000 acres of public land be colonized in this way. The cost will be approximately \$600,000, which is about one-seventh the cost of building the irrigation works.

The price of the excess privately owned land should be fixed before development begins. The bureau should cooperate with the owners of this excess land, promoting settlement in every practicable way.

### OWYHEE PROJECT, OREGON-IDAHO

The Owyhee project is located in the valley of the Owyhee River in eastern Oregon and in the vicinity of Homedale, Idaho, and includes 183,127 acres. It is estimated that 139,560 acres of this area are irrigable, 80,960 acres of which are new lands wholly undeveloped, 46,600 acres receive water from the Snake River by means of electric pumping plants, and 12,000 acres are under the privately owned Owyhee ditch requiring stored water to supplement their water supply.

The natural run-off of the Owyhee River will be supplemented by a large holdover storage located at the diversion dam site. A main canal with a capacity of 2,500 second-feet is required on the east side of the Owyhee River. It will begin at the diversion dam and extend a distance of  $7\frac{1}{2}$  miles. The topography along this line is rough and steep, and there will be seven tunnels from 700 to 8,800 feet long in a distance of 4.66 miles. One large siphon will be required to convey water across a canyon 800 feet wide and 220 feet deep.

The Mitchell Butte Canal branches off at the end of the main canal and crosses the Owyhee River in a siphon 250 feet long under a 275-foot head for nearly one-half its length. A tunnel 4,800 feet long is required on the west side of Mitchell Butte. The canal then runs through a rolling country to Vale Butte, about 65 miles from its head end. It then crosses Malheur River in a siphon between 2 and 3 miles long, of which about two-thirds will be under a head of 225 feet. The canal then follows along the slopes for about 30 miles to cover the Dead Ox Flat area and ends near the Snake River opposite Weiser, Idaho. The capacity will be about 1,200 second-feet at the head, decreasing to 25 second-feet at the lower end. The construction, although heavy, is not difficult except for the tunnel and two siphons mentioned. The location generally is in safe ground.

The Succor Creek Canal branches from the main canal to supply lands lying in both Oregon and Idaho. The first 13 miles will be through rough country requiring six tunnels of from 950 to 8,000 feet in length, a total of 3.6 miles. About  $1\frac{3}{4}$  miles of the canal will need to be lined. Beyond this the topography and formation are favorable, except for the crossings at Alkali and Succor Creeks which will require flumes or siphons. A tunnel 800 feet long is needed to reach the Squaw Creek country. This canal is about 72 miles long and presents no unusual construction difficulties, except as noted, and is generally in a safe location.

The cost of constructing the works has been estimated at \$16,800,000 divided as follows: \$25 an acre on lands under Owyhee ditch, \$117 an acre for lands now served by pumps, and \$137 an acre

for the new lands. The final estimates are not complete and the above estimates probably will be altered.

A committee was appointed in June, 1924, to make a land classification and to consider the agricultural and economic phases of the project. This committee, consisting of Prof. W. L. Powers, soil technologist, Oregon Agricultural College; Prof. G. R. McDole, soil technologist, University of Idaho; Prof. M. R. Lewis, agricultural engineer, University of Idaho; and A. T. Strahorn, soil surveyor, Bureau of Soils, is to determine the irrigable acreage, classify the lands in accordance with its productive capacity, estimate the gross annual crop returns when the land is irrigated, and submit a program for settling the large area of undeveloped land. The committee is assisted by F. O. Youngs, scientist in soil survey; Dr. R. E. Stephenson, soil technologist, Oregon Agricultural College; J. C. Marr, senior drainage engineer, Bureau of Public Roads; E. O. Larson and W. H. Blackmer, assistant engineers, Bureau of Reclamation. The report will be reviewed by a local committee consisting of Ivan E. Oaks, engineer, of Ontario, Oreg.; H. B. Cockrum, banker, of Ontario, Oreg.; and Dick Tensen, farmer, of Nyssa, Oreg.

Part of the Owyhee project is irrigated, developed, and settled, and part is wholly undeveloped. It is therefore essentially two projects. One consists of 58,600 acres, of which 46,600 acres are in the Kingman, Shortline, Ontario-Nyssa, Advancement, Payette Slope, Crystal, Snake River, Slide, and Gem irrigation districts, which are supplied with water by pumping from the Snake River, and 12,000 acres are under the Owyhee ditch. Some of the irrigation districts have bonded or other indebtedness. The owners of the land desire gravity water because it is cheaper than pumped water. The other project consists of 80,960 acres of sagebrush land, uncultivated, without settlers, and with no irrigation facilities.

Two plans of development are proposed. One is that the Government buy the existing distribution systems of the irrigation districts, except the Owyhee ditch, and amalgamate the irrigated land with the unirrigated land into one large irrigation district. The other plan is that the irrigation districts and the Owyhee ditch purchase water from the Government under the Warren Act and each operate its own irrigation system, as at present, and the Government construct the irrigation works for the undeveloped land and settle and develop it as a bureau project.

It is the policy of the bureau to turn projects over to the water users as soon as possible. The second plan described for the development of the Owyhee project is in agreement with this policy and therefore is the one favored, whereas the original estimates contemplated taking over the existing works of the irrigation districts and transferring their operation to the Government. The estimates given in this report are based upon the construction of canals large enough to supply water to the existing irrigation districts but do not include the construction of any irrigation or drainage works within their boundaries.

The undeveloped land of the Owyhee project is fertile, and profitable agriculture under irrigation seems assured. The settlers on improved farms should be able to meet the Government's charges.

The outstanding problem of this project is closer settlement; from 1,400 to 1,600 families will be needed to settle the undeveloped land.



Its feasibility requires that complete plans for settlement and farm development of both public and private land be made and agreed to by private landowners before construction is begun.

### VALE PROJECT, OREGON

The Vale project is located in the vicinity of Vale in eastern Oregon; water for the project will be the surplus run-off of the Malheur watershed, with storage in Warm Springs Reservoir, which has already been constructed by the Warm Springs irrigation district and which has a large surplus capacity over the requirements of the district. The district has offered to sell any part of the surplus storage capacity desired by the Government at \$8 an acre-foot, which is a reasonable price.

The plans contemplate a diversion dam, about 1 mile west of the Namorf Railway station, in the Malheur River, from which the canal will take water. For the first mile the canal will be located on the north side of the river, then cross to the south side to avoid the railroad. The line for 4 miles parallels the river on the south side and crosses the river again. Two miles are along steep canyon slopes; bench flume or concrete-lined sections will be required for much of this distance. Beyond this the canal location is through rough country requiring a number of expensive flumes, culverts and siphons, some lined sections, and three tunnels totaling 4,250 feet. After the canal reaches the benches the location improves and construction becomes less difficult. Although construction everywhere entails difficult and expensive work, the canal system will be on safe ground.

The cost of purchasing the required storage and constructing necessary canals, ditches, and drainage works is estimated to be \$3,587,300, or an average of \$126.50 an acre. Final estimates may slightly alter these figures.

A committee to review the economic conditions which affect the solvency of the project was appointed in June, 1924. It is composed of the following members: Prof. W. L. Powers, soil technologist, Oregon Agriculture College; W. W. McLaughlin, irrigation engineer, irrigation investigations; and G. H. Hogue, assistant engineer, Bureau of Reclamation. Their report is to be reviewed by a local committee of bankers and business men, consisting of Ralph Holte, D. Biggs, and R. DeArmand, all of Vale, Oreg.

The lands of this project are mainly sagebrush benches between Jamieson and Malheur Canyon and Harper Bench, having an area of 28,350 acres, classified as follows: Thirteen thousand nine hundred and sixty acres of class "A" land, which is almost level sagebrush, very desirable for irrigation both as to surface and soil conditions; 11,370 acres of class "B" land, which is sagebrush bench lands having a more rolling surface, a more remote location, or imperfect drainage; 3,020 acres of class "C" land, which is less desirable than class "B." The soil is generally of good depth and suited to the production of alfalfa, small grains, clover seed, hay, potatoes, and beans. The gross annual crop returns with irrigation should be about \$35 an acre.

Thirty-eight per cent of the land is held by two land companies, 15 per cent is public land, and the remaining lands are owned by individuals in tracts of 40 to 640 acres. Ninety per cent of the lands will require subdivision and settlement, and will provide farms for

250 to 300 families. The land in private ownership, which comprises 85 per cent of the whole, is undeveloped and unsettled; owners generally live elsewhere, and could not be consulted regarding their agricultural intentions if the project is carried out. A few letters received from landowners by the bureau officials at Boise stated their willingness to sell the unimproved land at \$5 to \$7.50 an acre. Some state that they intend to subdivide and sell as quickly as possible, but unless there is an appraisal and selling prices are fixed before development begins and this appraisal is made a part of the contract with the land owners, one of two things will happen: There will be a bitter controversy over the attempt to control prices by the bureau; or the inflation of land prices, which has taken place in the past, will be repeated here. Before construction begins, therefore, an irrigation district should be organized and a definite contract entered into with the district, which will control land prices.

This contract will not of itself insure prompt and satisfactory settlement or the solvency of this undertaking. The money to pay project costs and operation and maintenance expenses will have to be earned from the land by people who are not now on the ground. Some plan for the orderly settlement of the 15 per cent of public land and the 85 per cent of the area owned by individuals or corporations must be worked out and put into operation. Without this, development will be slow and payments in the early and critical years will be small. The feasibility of this project depends upon plans adopted for prompt settlement and agricultural development.

Enough is known of the committee's investigation of economic conditions to warrant the statement that they regard settlement as the fundamental problem of this project and that their recommendations will include the following:

1. That long-time credit be extended to new settlers.
2. That a competent agriculturist be employed to aid and assist the settlers.
3. That the Secretary of the Interior fix the prices at which excess holdings are to be disposed of to settlers.
4. That provision be made for clearing and preparing a portion of each farm unit by the Bureau of Reclamation prior to settlement.
5. That settlers be selected in accordance with their experience, capital, and other desirable characteristics.
6. That one irrigation district be formed to include all the lands in the proposed project.

If development can be carried out in accordance with the settlement plans outlined above, and in conformity with the recommendations of the advisory board for classification of land and repayment of construction charges based on crop returns, the Vale project is regarded as feasible and desirable.

#### **SPANISH SPRINGS EXTENSION, NEWLANDS PROJECT, NEVADA**

The water supply for this extension will be obtained from the Truckee River with storage in Spanish Springs Reservoir. The feed canal diverts from Truckee River about 5 miles above Reno and will have a total length of 12.85 miles and a capacity of 636 cubic feet per second. The reservoir is to have a capacity for ultimate development of 307,000 acre-feet, with a dam 116 feet high. The first development requires a capacity of 100,000 acre-feet. An outlet canal

from the reservoir discharges into Truckee River, whence the water is diverted at the existing Derby dam of the Newlands project and carried 6 miles in the present Truckee Canal to the point of diversion for land in the vicinity of Wadsworth.

Part of the lands in the Truckee area is to be served direct from the present Truckee Canal. The irrigable area is classified as follows: Truckee division, including Hazen Bench, new lands, 21,073 acres; Pyramid division, 25,023 acres; total 46,096 acres. This area is interspersed with 4,107 acres of developed private and Indian lands which must be deducted, leaving a net irrigable area of approximately 42,000 acres.

There are in addition 7,235 acres of old lands in the Newlands irrigation district in need of additional water, which will be provided by this reservoir. The total estimated cost of this extension is \$6,044,000, or approximately \$144 an acre.

Construction of the reservoir and subsidiary works will salvage the large investment in the Truckee Canal, and will be of great benefit to settlers on 7,235 acres under this canal who are short of water.

The area to be developed is adjacent to Reno, the largest city in Nevada, through which the Truckee River flows. Development of the water resources of this stream and the settlement of adjoining lands in the Spanish Springs extension will have unusual value to Reno and the State of Nevada.

Nevada has a limited population: It has a low rainfall, and much of its area is used only for livestock ranges. The production of forage crops under irrigation greatly supplements the livestock industry. Part of the land is occupied by settlers who need a supplemental water supply, a part is public land, a part is owned by the Southern Pacific Co. In order to keep its land from falling into the hands of people who might not be farmers, and thus retard development of the project, the Southern Pacific Co. has withdrawn these lands from sale and offered them to the Government at a nominal price. The purchase of these lands by the Government would save the project from the evil effects of speculative inflation in land prices and permit a united plan of colonization and farm development to be formulated for the entire area.

A committee was appointed in June, 1924, to examine the lands and report on the economic and agricultural conditions of the extension. The members of the committee are Prof. David Weeks, University of California; Prof. Robert Stewart, dean of agriculture, University of Nevada; Dr. F. B. Headley, Bureau of Plant Industry, Department of Agriculture; Prof. C. W. Creel, director of agricultural extension, University of Nevada; and Prof. S. B. Doten, director of the Nevada Experiment Station. After the committee has reached its conclusions, its report is to be submitted to a group of business men consisting of bankers, farmers, and others familiar with the cost of developing raw land. This group consists of the following citizens of Nevada: George Wingfield, W. J. Harris, W. A. Shockley, W. H. Simmons, and J. Sheehan.

Enough already has been learned to indicate that the committee's report will be favorable. The conclusions show that a farm unit on first-class land should be about 50 acres and that the conditions of climate and soil will permit the production of a considerable variety of agricultural crops, including small grains, alfalfa, clover and grass

pasture, potatoes, onions, cantaloupes, and small fruits, and that the agricultural development should be based on the dairy industry supplemented by home flocks of poultry, a few hogs, and some cash crops.

The committee estimates that the cost of changing 50 acres of sagebrush into an improved farm is from \$7,000 to \$9,000, and the cost of clearing, leveling, and constructing farm ditches is from \$40 to \$60 an acre. Owing to the high acre cost of water, the necessity of growing crops as soon as possible after water is provided, and the scarcity of settlers with sufficient capital to completely develop and equip the farms, the committee will recommend that the cost of clearing and leveling land be included as part of the construction cost. This feature will add approximately \$50 to the acreage cost of the project.

The committee's report will be completed before this project is to be considered by Congress

#### **SALT LAKE BASIN PROJECT, WEBER-PROVO DIVISION**

The first work to be undertaken in the Salt Lake Basin project will be the construction of Echo Reservoir, with a capacity of 74,000 acre-feet. The reservoir site is about 1 mile east of Echo. Lincoln Highway and the Park City Branch of the Union Pacific Railroad traverse the entire length of the reservoir bed. The construction of the reservoir will involve the reconstruction of part of the branch railroad and a considerable length of the Lincoln Highway.

The dam will be about 150 feet high, about 1,300 feet long, and contain nearly 1,500,000 cubic yards of embankment material. It will be of the earth-fill type, with upstream slope faced by rock for protection from wave action. An abundance of suitable material for the dam is located on the west side of the river.

It is also proposed in connection with the first division of the Salt Lake Basin project to construct a diversion canal heading in the Weber River at high altitude and crossing the divide to Provo River for the purpose of diverting some of the surplus waters of the Weber into the Provo watershed. The two streams are separated by an old flood plain some 8 miles wide, and it is an easy matter to divert the waters of either river across the plain to the other. The diversion canal will have a capacity of about 1,000 second-feet and will be about 10 miles long.

The irrigable land of both valleys is settled and in a high state of cultivation. The farms are small and largely devoted to the growing of sugar beets, fruits, and vegetables for factories and local consumption. Intense culture makes a dependable water supply for late irrigation of prime importance. Reservoirs to regulate the stream flow offer the only means by which this can be assured. Farmers in the two valleys have expressed a strong desire for this storage and a willingness to pay the entire cost. Contracts for this water are being prepared. The benefits and returns will follow immediately on completing the storage. It is regarded as among the most meritorious of all the projects yet undertaken.

A committee consisting of the following members has been appointed to review and report on existing conditions: Lloyd Garrison, State engineer of Utah; William Green, engineer, Bureau of Reclamation; J. R. Alexander, district counsel, Bureau of Reclamation.

## CLASSIFICATION OF LANDS OF PROPOSED PROJECTS

The total irrigable area of the proposed projects described above is classified as to public, private, railroad, and State land in the following table:

*Classification of acreage, proposed projects*

Project	Total irrigable	Public	Private	Rail- road	State
Owyhee.....	139,000	18,000	116,000	-----	5,000
Vale.....	28,000	4,000	24,000	-----	-----
Baker.....	27,000	12,000	15,000	-----	-----
Kittitas.....	70,000	5,000	60,000	4,000	1,000
Spanish Springs.....	42,000	15,000	23,000	4,000	-----
Salt Lake Basin (first unit).....	110,000	-----	110,000	-----	-----

<sup>1</sup> Includes 3,000 acres of Indian lands.

## COMPLETION OF EXISTING PROJECTS

In general the extension and completion of existing projects should be given preference over the adoption and commencement of new ones. There are a number of compelling reasons for this. Under present law the Federal reclamation work is limited by the resources of a special fund in the Treasury known as the reclamation fund. To add new projects spreads the available funds and efforts over too large a program for the most effective and economical work. For each project a certain overhead organization and expense are necessary. With the funds spread thinly over too many projects this overhead must be carried for years longer than is necessary, with consequent increase in total costs. After the works are built their operation, involving delivery of water and other dealings with the farmers, requires different kinds of talent. If the construction work is dragged along concurrently with the maintenance and operation of project units it is necessary to have both construction and operating forces with extra cost and division of interest.

On some of the projects partially completed there are units or divisions where no canals have been constructed or where ditches are available but storage is lacking. In the one case no water can be served, in the other only a partial supply. In either case the Government has a substantial investment from the reclamation fund tied up in storage or in canals with repayment deferred. Water, if served at all, must be peddled on a basis of annual water rentals, which charges are for the operation alone and commonly do not fully meet even that expense. If settlers are on the lands, they are handicapped by lack of water and on a limited agriculture, using dry farming operations where the rainfall permits. Such conditions produce no return on investment but lead to criticism of the Government and develop a type of agriculture that can not succeed.

Such conditions are illustrated by the situation on the Greenfields Bench of the Sun River project in Montana. Canals have been built for 60,000 acres, but the required storage reservoir has not been built. Settlers have come and gone. Many for a time thought that irrigation was undesirable, discouraging the Government from carrying on the project more vigorously. But the present settlers are virtually unanimous in an appeal for completion of the project

and meanwhile occupy a sorry position, carrying on an extensive type of farming, using some flood water but largely depending on the meager and uncertain rainfall of the semiarid region. The lands are heavily mortgaged, including the Government lien for construction charges. Until the work is more nearly complete the amount of this lien is unknown and the settlers are hampered in financing operations. In such a situation the United States should proceed to the completion of the project.

#### **A TENTATIVE PROGRAM IS AVAILABLE**

A program of operations during the fiscal year ending June 30, 1925, is fixed by the Interior Department appropriation act for that year.<sup>1</sup> Until the corresponding appropriations are made for future years no one can guarantee the construction of any particular canal, reservoir, or project. Approval of such things rests with Congress. It is possible, however, to make a tentative program.

The accretions to the reclamation fund, although not precisely determinable in advance, are by law limited to certain specific items, and experience gives a fairly accurate guide for estimating the money to be available. From records of past receipts over a considerable term of years it seems clear that the money available for new work will not exceed a million dollars a month. To complete the projects already in hand would readily absorb such funds for a decade. This is shown in the adjoined table, which sets forth a tentative program for the use of such funds, the completion of existing projects, and the construction of those new ones that seem to be on the threshold of approval by Congress, as indicated by action on the pending deficiency bill. This of course does not include all the new projects that are under consideration. Nor does it cover all features and possible extensions of old projects, but in general it harmonizes water storage with distribution facilities and brings the development to the point where construction may be regarded as complete so far as work by the Government is concerned.

The list of works needed to complete existing projects does not include all that have been recommended for consideration. The people under the Carlsbad project desire additional storage, and another reservoir is being urged for Orland. Doubtless suggestions for other extensions and additions will be forthcoming by the publication of this tentative program.

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<sup>1</sup> Act of June 5, 1924 (43 Stat. 415).

## Tentative program of future work

Old projects	Tentative program by fiscal years										
	1925	1926	1927	1928	1929	1930	1931	1932	1933	After	
Yuma.....	\$570,000	\$75,000	\$38,000								
Orland <sup>1</sup> .....	2,000	2,000	3,000								
Grand Valley:											
Original.....	183,000	28,000				\$430,000					
Orchard Mesa.....	232,000	200,000									
Uncompangre.....	15,000	28,000	7,000								
Bolsa:											
Arrowrock <sup>2</sup> .....	130,000	70,000	78,000	\$163,000	\$120,000						
Hillcrest.....	450,000	\$865,000	500,000	500,000	1,000,000	1,000,000	\$1,000,000	\$485,000			
Black Canyon.....	200,000	19,000	140,000								
Mimfiooka.....											
North Side Unit <sup>1</sup> .....											
American Falls Reservoir.....	675,000	627,000	1,000,000	1,412,000	1,250,000	1,250,000	1,250,000	1,250,000	\$1,250,000	\$1,261,000	
Huntley.....	100,000	68,000	20,000	24,000	10,000	10,000	7,000				
Milk River.....	245,000	11,000	180,000	160,000	118,000						
Sun River.....	100,000	* 11,000	874,000	1,315,000	1,397,000	800,000					
Lower Yellowstone.....	35,000	105,000	80,000	88,000							
North Platte.....	1,095,000	* 900,000	900,000	1,024,000	50,000	39,000					
Newlands <sup>1</sup> .....	* 36,000	285,000	641,000	122,000							
Carlsbad <sup>1</sup> .....		20,000	20,000								
Rio Grande.....	452,000	400,000	371,000								
Williston <sup>1</sup> .....											
Umatilla.....	900,000	800,000	780,000	245,000	290,000						
Klamath <sup>1</sup> .....	615,000	446,000	446,000	159,000							
Belle Fourche <sup>1</sup> .....	100,000	100,000	100,000	270,000	100,000						
Okanogan.....	20,000	19,000									
Yakima:											
Storage.....	400,000			150,000	500,000	500,000	1,000,000	500,000			
Sunnyside.....			136,000								
Tieton.....	10,000	10,000	7,000								
Kittitas.....		* 750,000	1,250,000	1,750,000	1,750,000	652,000					
Moxee <sup>11</sup> .....											
Rosa <sup>11</sup> .....											
Kanawick <sup>11</sup> .....											
Riverton.....	650,000	790,000	800,000	800,000	800,000	800,000	800,000	3,460,000	4,000,000	7,368,000	
Shoshone.....	360,000	304,000	363,000					800,000	286,000		
Heart Mountain.....											
Oregon Basin.....	5,000										
Total, old projects.....	7,579,000	7,483,000	8,704,000	8,427,000	7,385,000	7,481,000	6,087,000	6,478,000	5,536,000	18,868,000	

NEW PROJECTS									
Spanish Springs <sup>12</sup>	750,000	750,000	750,000	750,000	845,000				
Baker	450,000	500,000	500,000	750,000	691,000				
Vale	600,000	500,000	500,000	500,000	510,000	1,000,000	1,515,000		
Owhee	750,000	750,000	750,000	1,250,000	2,000,000	2,000,000	2,500,000	6,500,000	
Salt Lake Basin <sup>12</sup>	1,500,000	800,000	900,000	1,200,000	1,000,000	2,000,000	2,500,000	( <sup>19</sup> )	
Total new projects	450,000	4,250,000	3,300,000	3,400,000	4,065,000	5,691,000	6,516,000	14,500,000	
Grand total	8,029,000	11,733,000	12,004,000	11,827,000	11,576,000	11,748,000	11,978,000	12,052,000	28,366,000

**Does not include supplemental storage for which studies are being made.**

Does not include funds to be advanced to other users for drainage

Part or all included tentatively in supplemental estimate for 1926.

\*Includes \$285,000 for Spanish Springs storage for

<sup>5</sup> Does not include \$245,000 for drainage duplicated in 1926.

Does not include additional storage which may be needed.

Recommended for sale.  
\$100,000 1924 northeast 110 bluffs for Cashmere Down and Collected

\$300,000 1924 contract liability for Gerber Dam not included.

**ii** Order of development not decided.

12 \$385,000 additional included in Newlands project.

Additional amount may be needed depending upon units selected

and indefinite.



## EXPLANATION OF PROJECT NEEDS

*Yuma project.*—The Main Canal goes through the Picacho (dry) wash. There have been heavy floods down this wash on several occasions, filling up the canal with débris, and it has taken several days to clean out the canal and repair the breaks in its banks. Although no material damage has been done to crops due to these floods in the past, severe damage is likely to occur and the water users have asked that a structure be placed in the canal permitting the floods to pass over. Plans have been prepared and this matter will be submitted to the water users for a vote for supplemental construction.

Power is now being purchased for pumping water to the Yuma Mesa Auxiliary project, also for the Boundary drainage pumping plant and for shop and canal purposes at Yuma. Congress has authorized the construction of a power plant at Siphon Drop in the Main Canal of the project, provided a suitable contract can be entered into with the water users guaranteeing the return of the costs. Such a contract will be submitted to them for their approval.

The balance of the estimate is to complete the Yuma Valley drainage system, now under construction.

*Orland project.*—A small amount is required to complete the lining of laterals on the Orland project. This is covered in the contract with the water users to repay the cost of the project.

On account of the extreme drouth in 1924 the water users have requested that additional storage be provided at the Millsite Reservoir. Estimates were made a few years ago of the cost of building a dam, and water supply studies are now being made to show what additional water the project would have had this year, provided the Millsite Reservoir had been built and was available for storage during the past several years. Inasmuch as these studies have not been completed and as this reservoir was not contemplated originally as a part of the project, no estimate is now included for it. It may, however, be found advisable to build such a reservoir later on.

*Grand Valley project.*—It is proposed to complete the canal laterals and drains on the Gravity division of this project. The plans also contemplate the construction of a pumping plant to pump water onto about 10,000 acres of land. This will require a lateral system. The amount of money requested for the Orchard Mesa division for 1926 will complete that division of the project.

*Uncompahgre project.*—A small sum is estimated for lateral extensions and payments for vested rights.

*Boise project.*—When the public notices were issued for the Boise project, allowances were made for certain canal betterments. A large part of these improvements is for the lining of the main canal and the rebuilding of some of the structures. In draining the project certain outlets will be required outside the limits of the project and this is estimated for. The Meridian pipe line is proposed to water 455 acres. It has been planned to pump water onto several small areas in the project by developing power at canal drops.

The Hillcrest division contains 14,000 acres of land located just above the main canal near the city of Boise. Storage has been provided for this area in the Arrowrock Dam Reservoir, and a portion of the diversion dam has been charged against this unit, as well as a portion of the diversion dam power plant. The cost of these features

will remain a frozen asset until the pumping plant and canal and laterals can be constructed for this division. The lands are of excellent quality. Hence an appropriation has been recommended for completing this division in the fiscal year 1926.

The Black Canyon division of the project, containing 56,000 acres, has been investigated and the diversion dam for it has been completed. The table suggests funds to begin the construction of this division in the fiscal year 1927. Congress has already authorized the construction of a power plant at the Black Canyon Dam, which will be used first for pumping water for the Gem district (provided suitable contracts are entered into) and later on used for pumping to lands in the Black Canyon district.

*Minidoka project.*—The South Side Minidoka project requires some additional water, and \$200,000 has been appropriated for the purpose of enlarging the canals and improving the efficiency of the pump runners so that additional water can be pumped, and it is proposed to do this additional work this coming winter provided a satisfactory contract can be made with the water users to cover the cost. About 1,400 additional horsepower is highly desirable for the project in order to give good service during the height of the irrigation season. For that reason \$140,000 has been put in the estimate as the cost to complete that project, and to purchase an interest in one of the power units which it is hoped will later be installed at the American Falls power plant for creating power to pump water on the north side of the Minidoka project, which also calls for the construction of pumping and distribution systems.

*American Falls.*—Should the construction of a reservoir at American Falls be authorized with a capacity of 1,700,000 acre-feet and no additional contracts be made for storage, \$1,412,000 will be required after June 30, 1926, to be advanced by the United States. It is believed, however, that a large portion of this amount will be advanced by canal companies and irrigation districts in the Snake River Valley that require some storage water to supplement their present rights.

*Huntley project.*—Some of the lands within the limits of the Huntley project are refractory, but it is believed that they can be utilized efficiently, as it has been shown that sweet clover can be grown on this land and after a few years grains can be successfully grown. For that reason a small amount of money has been used each year on experimental farming. A small amount of money is also recommended for canal and lateral betterments and for drainage.

*Milk River project.*—There have been a number of unfortunate circumstances attending this project and one has been the long delay in its completion, which has precluded the determination of costs per acre, restricting the ability of settlers to finance their operations and curbing the further settlement of the project, which it badly needs. To cure this defect it is proposed to proceed actively with the completion of the irrigation system so far as it is contemplated work will be done by the United States. This includes the completion of Sherburne Lakes reservoir and the St. Mary Canal, which requires additional pipes at points where the canal crosses drainage channels. These items are expected to cost \$479,000. For a relatively small expenditure the canals and laterals in the Malta and Glasgow divisions can be rounded out to fit the water thus provided and the program includes a round figure of \$100,000 for drainage. The project can then be regarded as complete.

*Sun River project.*—This project has the misfortune to be located in the transition zone between distinctly arid and distinctly humid conditions. Sentiment for irrigation wavers with rainfall. This has delayed completion of the system, and the resulting situation is a striking example of the unfortunate results of such delay—dissatisfied settlers, limited agriculture, and latent Federal investment, unproductive alike of returns to the reclamation fund and of satisfactory crops. On the Greenfields Bench division of the project canals have been built for 40,000 acres of land, but the related storage has not begun. Some flood water is delivered in the spring, but at the height of the season, in August, when water is most needed it is lacking. The mean August flow of Sun River for a recent 7-year period is 339 second-feet, whereas rights prior to the project are more than double this figure. This condition has caused heavy crop losses and deprives settlers of water just at the time needed to bring crops to maturity, a condition that will continue to be serious until the reservoir is built.

The action called for under these circumstances is prompt construction of the reservoir and other works to complete the system. This involves storage at the Beaver Creek site on Sun River, enlargement of the North Side Canal, and extension of the distribution system to 80,000 acres of land. The program tabulated includes these things; also a small amount of work remaining on the Fort Shaw distribution system south of the river and some drainage work contemplated there and on the north side.

*Lower Yellowstone project.*—The program estimates \$3,000 for additional lateral extension and \$300,000 for drainage. Before the drainage work can be done a suitable contract will be needed with the irrigation district.

*North Platte project.*—The estimates include \$1,904,000 for the Guernsey Reservoir and \$620,000 for power development at the same point. Some additional drainage will also be required on that project. The completion of the Fort Laramie division will require over a million dollars and relatively small amounts are included for distribution and drainage works on the Interstate and Northport divisions.

*Newlands project.*—It is still hoped that a small amount of storage can be secured from Lake Tahoe, for which \$142,000 has been estimated for outlet improvements and damages to riparian rights. Some money has been allowed for payment of damages at Lahontan and for the completion of the power plant which was nearly completed in the fiscal year 1924. Should the Spanish Springs Reservoir be constructed 7,235 acres of land in the Newlands project could secure storage from this reservoir. For that reason \$385,000 to cover the cost for this storage is included in the old Newlands project. The remaining cost of the Spanish Springs project is included under the head of new projects. Eventually additional laterals will be needed both on the Carson and the Truckee divisions of that project and about \$300,000 for drainage will be required.

*Carlsbad project.*—Some additional canal lining and additional drainage work should be done on this project.

*Rio Grande project.*—The remaining work on this project consists of completing the distribution systems and additional drainage, for which \$371,000 may be required after the fiscal year 1926. The

contracts with the districts permit the expenditure of that amount. It is hoped, however, that a considerable saving can be made so that all of the \$371,000 will not be required.

*Umatilla project.*—On the Umatilla project contracts with the East division contemplate an expenditure after June 30, 1924, of \$327,000 and on the West division of \$163,000. Districts have been formed embracing the lands under the Western and Furnish Canals of the Umatilla project and some additional lands adjacent thereto. A contract is now being considered with the Westland district, embracing the area for an improvement of the Western Canal system and the construction of some additional laterals. If this contract is entered into, \$245,000 will be required; \$290,000 will be similarly required for laterals under the Furnish Canal, but no contract has yet been made. The bureau is now constructing a dam for the McKay Reservoir for which \$1,940,000 will be required after June 30, 1924.

*Klamath project.*—Operations on this project exposed the bed of Tule Lake for cultivation which requires irrigation and drainage, which accounts for \$1,160,000 of the estimate to complete the project. There is some canal enlargement for the benefit of lands to be reached by pumping and some additional construction on the irrigation system in Langell Valley.

*Belle Fourche project.*—No construction work has been done recently on this project but a part known as the Willow Creek extension has never been completed. This and funds for drainage complete the program.

*Okanogan project.*—This has virtually been completed for years but owing to water shortage additional expenditure is desirable for lining canals or pumping facilities and other provision to improve the service.

*Yakima project.*—The Tieton Reservoir is well toward completion, which is an essential part of the program, and further work is needed on the Kachess Reservoir wasteway, but the largest item of storage is a new reservoir on Lake Cle Elum.

On the existing distribution divisions there is work on the Mabton pumping area. Some minor extensions in lateral lining will probably be done on the Tieton and a small amount of money is included in the program for Granger and Outlook district laterals.

*Riverton project.*—The canal and lateral systems will require an additional \$3,798,000 according to present estimates, including the current appropriation. With the distribution system thus completed storage is contemplated at Bull Lake and Pilot Butte Reservoirs; \$1,600,000 is included for drainage, \$144,000 for power development, and \$131,000 for miscellaneous construction.

*Shoshone project.*—The Garland division is complete except for additional drains which are expected to cost \$376,000. Frannie division drainage is included at \$158,000. On the new Willwood division additional work on the canals as well as drainage is included at \$483,000. The project is susceptible of extension to the Heart Mountain and Oregon Basin divisions, but the funds for these are set down in the last column of the table because the order of development has not been fixed.

## LEGAL ACTIVITIES

The law work of the Bureau of Reclamation is not easily comparable with that of any other Government bureau. The statutes under which the bureau functions blaze new and unusual trails, with little of legal precedent as a guide. The general water law of the West is not yet out of the formative period, and the special laws relating to Federal irrigation, consisting of nearly 100 separate statutes, are still more experimental. Through an investment of approximately \$143,000,000 in Federal irrigation works the bureau has a contractual relation with upward of 35,000 individuals. This is not the ordinary impersonal Federal relation, but the very difficult one of creditor and debtor. The usual situation is not present in which the adjustment of a disagreement is in the discretion of a Government official, but one in which cooperative action is essential.

Through the construction and operation of two dozen costly irrigation projects in 15 States with different laws, many unusual and complex situations develop. The building of cement works, power plants, railroads, and towns adds to the problem. If the recommendations of the Committee of Special Advisers on Reclamation are enacted into law, there will be further additions to the problem. There is probably no other bureau of the Government that has proportionately so large, unusual, and complex a legal burden as the Bureau of Reclamation.

The law work in the field is carried on by attorneys known as district counsel who are assigned at the present time to seven districts, each embracing a group of projects. These district counsel act as the legal advisers of the several project officials and their respective districts and help settlers to understand their legal relation to the Government. This is an important matter where so many conditions are strange and new. In the Washington office the law work is handled by the law adviser of the Commissioner and the solicitor of the department.

The law work involves, among other things, securing rights of way, passing upon abstracts of title, adjustment of claims and disputes, drafting of contracts, preparation of State and Federal legislation, briefing, trial of law suits, and general consultation. There are at the present time upward of 31 pending law suits. This litigation involves several million dollars and presents many unique questions of law, some of them without precedent. It includes suits on contracts, damage cases, contract confirmation proceedings, condemnation actions, and water-right adjudication suits. Technically, this litigation is in the hands of the Department of Justice, but the bureau attorneys are most familiar with it and, as a rule, carry the burden of the work of handling it. Much of this litigation is of a friendly rather than of a belligerent nature.

## GOVERNMENT WATER RIGHTS

Section 8 of the national irrigation act of 1902 relates to Government water rights. It directs that the Secretary of the Interior proceed in conformity with State laws in carrying out the provisions of the act of 1902. This section is construed by the Department of Justice to be directory, in the interests of comity, but not mandatory. However, so far as practicable the Bureau of Reclamation complies with State requirements concerning water appropriations.

The laws of the different States do not agree with each other in regard to the manner in which rights to the use of water are established or the nature of those rights. Some of the States have no administrative control over streams. In a number of them there is great uncertainty as to the extent to which the doctrine of riparian rights applies. An attempt to follow State laws on a Government project located in two States with divergent water laws may offer unusual difficulties. Again, the laws of several of the States are in direct disagreement with the Federal statute which requires that water rights shall be appurtenant to the land. It would be very desirable if all these conflicts could be removed.

The growing use of water for hydroelectric development conflicts to a certain extent with the use of water for irrigation, and there is need that a general program be approved under which rights to these two uses would be carefully defined that serious injury may not later result.

So long as the water supply for a project is ample there is usually little need of securing an adjudication of rights on the stream system from which the water is supplied. This is generally true during the early years of a project before it is fully developed and use made of all of the water which it claims, although there are cases where early adjustments are desirable to prevent private claims from later being enlarged to unwarranted dimensions. However, there is certain to come a time after development is well advanced or completed when it is necessary to measure carefully the claims made by the different appropriators on the stream system. This is done through an adjudication proceeding in which all parties in interest are brought into court and their rights judicially determined. Sooner or later such a determination will be necessary as to most, if not all, of the projects.

Heretofore the bureau has been interested in adjudication proceedings affecting the Umatilla project in Oregon, the Salt River project in Arizona, the Uncompahgre project in Colorado, the Boise project in Idaho, the Milk River and Sun River projects in Montana, and that part of the Carlsbad project in New Mexico affected by Black River.

At the present time adjudication proceedings are being carried on to determine water rights on the Carlsbad project in New Mexico, on the Newlands project in Nevada, and on the Orland project in California.

It appears likely that it will be necessary to institute in the near future proceedings of this nature to determine rights on the North Platte River in Nebraska affecting the North Platte project, on the Carson River in Nevada affecting the Newlands project, and on the Yakima River in Washington affecting the Yakima project.

In the case of interstate streams some attempts are being made to allocate by contract the waters therein according to States. A compact of this character respecting the Colorado River was negotiated at Santa Fe, N. Mex., November 24, 1922, by representatives of the States of Wyoming, Colorado, Utah, Nevada, New Mexico, Arizona, and California and of the United States. It has been formally approved by all of the States save Arizona. A similar compact concerning the use of the waters of the La Plata River has been made by the States of Colorado and New Mexico. Another respecting the waters of the South Platte River is about to be completed by the States of Colorado and Nebraska. Commissioners are now conduct-

ing negotiations looking to the making of compacts between Texas and New Mexico concerning the Pecos River; between Texas, New Mexico, and Colorado respecting the Rio Grande; and between Nebraska, Wyoming, and Colorado relative to the North Platte River. Such compacts settle water disputes between States but do not adjust conflicts between appropriators within a State. The Bureau of Reclamation is either directly or indirectly interested in all of these proceedings.

### TENANTRY

The reclamation law was intended to be a home making law. Its central purpose was to create on what were naturally arid wastes new and permanent homes for citizens of the Republic. It was anticipated that those who partook of its benefits would reside upon the land and cultivate it. The principles of the public land law are opposed to tenantry, and the absentee landlord did not have a place in the picture of Federal irrigation as drawn by the sponsors of the organic act of 1902.

Nevertheless, there has at all times been a large percentage of tenants on Federal irrigation projects. In 1912 it was 21 per cent and in the prosperous years of 1917 and 1918 it rose to 32 per cent. In 1920 it was 24 per cent; in 1921, 26 per cent; and in 1922, 24 per cent. The maximum project percentage was 74 per cent on the Carlsbad project in New Mexico in 1920, and the minimum project percentage was 0.4 per cent on the Okanogan project in Washington in 1914.

There is more than one cause for this generally unhealthy condition. In some cases the relation of landlord and tenant arises from the failing health of the owner; in others, on account of removal of the owner because of unexpected business demands. However, the main causes are the ownership by single individuals of large areas when projects are authorized, and the acquiring of title through the foreclosure of mortgages made on terms the settlers could not meet. In most of these cases there is an element of speculation.

Excess holdings are prohibited by the law. The act of August 9, 1912 (37 Stat. 265), forbids the furnishing of water to such holdings and provides for forfeiture of title. Notwithstanding these drastic provisions, the Government seems to be unable to cure the trouble. Although the spirit of the law is broken, the letter of the law is observed by fictitious conveyances, and the Government is almost helpless.

In a few cases the tenant is preparing to purchase the land and make a permanent home of his own thereon. But this is not at all general, and it is quite certain our irrigation developments can never be fully successful until the present high percentage of tenantry is much reduced. This end possibly may be attained in a small degree through a more rigid and searching application of the law against excess holdings of land. However, it would seem that the real cure for the trouble must come through a better control over lands in private ownership when projects are adopted, the selection of settlers who are real dirt farmers, the furnishing to them of money for development purposes at reasonable rates, and the adoption of the plan of assistance and guidance heretofore discussed, under which conditions on the farms will be so improved that there will be a strong incentive for the owners to stay upon the land.

## CONTRACTS UNDER THE WARREN ACT

Reference has already been made to contracts authorized by the so-called Warren Act of February 21, 1911 (36 Stat. 925), under which the bureau has sold permanent water rights from the projects for the irrigation of upward of 1,000,000 acres of land lying outside of the projects.

Section 1 of this act provides for the sale of such rights, "reserving a first right to lands and entrymen under the project." Section 2 of the act provides for contracts, "upon such terms as may be agreed upon." These two sections seem to be somewhat in conflict, and there has been dispute as to their meaning.

It seems to be of questionable propriety for the Government to sell a water right of an inferior nature. Apparently it is a better policy to put all Federal water rights upon the same plane. It is argued by some that the water users under the projects proper should have a better right than the water users outside of the projects. There does not, however, seem to be any good reason to uphold this position. The Warren Act contractors outside of the projects pay in full for what they get in the same manner as do the water users under the projects. Moreover, in some cases they actually advance the moneys with which to construct irrigation works to provide for the additional water supply, instead of letting the Government advance the money and paying it back in 20 years without interest.

Contracts under the Warren Act are now rather generally being made under section 2 of the act, and provide for rights having the same priority as those on the project from which the water is sold.

## DISPOSAL OF UNSUCCESSFUL PROJECTS

The Hondo project in New Mexico and the North Dakota pumping project in North Dakota have proved to be unsuccessful and should be disposed of by the Government.

The Hondo project was authorized in 1904, and on June 30, 1924, involved an investment of about \$372,000. It was intended to irrigate an area of about 10,000 acres from storage on the Hondo River. The reservoir could not be made to hold water and the Government has abandoned operation.

The North Dakota pumping project in North Dakota was authorized in 1906 and was intended to irrigate about 26,000 acres with water pumped from the Missouri River. On June 30, 1924, the Government investment was about \$1,146,000. The high cost of irrigation water due to pumping, and the low value of irrigation water due to the rainfall, have made this development unsuccessful. Irrigation on the Buford-Trenton division was discontinued several years ago. The Williston division is still being operated, but without substantial promise of repayment of costs.

The interests of the Government in both of these projects should be sold at public auction to the highest bidder, in accordance with the recommendations of the Committee of Special Advisers on Reclamation.



### OPERATIONS DURING THE FISCAL YEAR

During the fiscal year 1923-24 the Bureau of Reclamation continued the operation and maintenance of irrigation works previously constructed, built extensions and additional works in various States, and conducted investigations for further extensions and possible new developments. More detailed information regarding these activities will appear under the head of each project and statistically in the appendix of this report.

The maintenance of constructed works and their operation for delivery of irrigation water continued without extraordinary event until the close of the fiscal year when the most westerly States entered a season of unusual drouth. Most of the Government projects were well supplied with water, but at a few points serious shortage impended.

The Tieton Dam on the river of the same name in Washington, to be 244 feet high and impound 202,500 acre-feet of water, and the Black Canyon Dam in Idaho, 183 feet high to divert water from Payette River, were virtually completed. A third dam is being built on McKay Creek, a fourth on Lost River in Oregon, while specifications for a fifth on Snake River at American Falls, Idaho, are being prepared and preliminary work and negotiations are being carried on. On a number of projects canal systems were extended to additional lands and drainage channels were excavated for the protection of the irrigated areas from waterlogging.

Funds available by Federal appropriation were enhanced by cooperative arrangements with local interests for investigations in the various arid States, including two projects of a magnitude greatly exceeding any developments thus far undertaken. One of these involves storage and control of the Colorado River, on the engineering features of which the chief engineer completed a voluminous report. A report was made on the Columbia Basin project in Washington supplementing previous studies by the State.

One index of the bureau's activities during the year is the number of contracts entered into and the different subjects involved, which are summarized in the following table:

Nature of contracts	Number of contracts	Amount involved
1. Cooperative investigations.....	14	\$157,700. 00
2. Supplies.....	955	1,167,577. 54
3. Material.....	426	526,094. 15
4. Equipment.....	193	396,365. 90
5. Miscellaneous services.....	344	837,063. 43
6. Construction work.....	282	1,905,710. 94
7. Land purchases, including improvements.....	194	496,111. 09
8. Land sales, including improvements.....	161	214,000. 00
9. Leases to the United States.....	52	12,694. 78
10. Leases from the United States.....	426	80,548. 23
11. Compromise of damages.....	33	42,590. 26
12. Rental of Government equipment.....	11	21,892. 60
13. Rental of water.....	517	224,297. 91
14. Sale of surplus electrical energy.....	18	147,456. 50
15. Sale of water rights to towns.....	1	780. 00
16. Sale of water rights under the Warren Act <sup>1</sup> .....	6	964,445. 00
17. Sale of water rights within projects.....	346	1,193,605. 96
18. Adjustment and relief <sup>2</sup> .....	4	6,362,277. 43
19. Transfer of project operation.....	0	
20. Miscellaneous.....	243	244,279. 31
Total.....	4,226	\$ 15,123,779. 42

<sup>1</sup> Includes some construction work.

<sup>2</sup> Estimated in part.

<sup>3</sup> Does not include relief given to individual water users, and includes some construction work.

In Arizona the Government-built project on Salt River continued under operation by the local water users' association, which with approval of the department has engaged on a construction program of additional water storage and power development. The bureau continued to operate the Yuma project on the Colorado River, serving lands in Arizona and California. Construction continued on the drainage system of this project and extensive repairs were made to the apron below Laguna Dam. Water was delivered to the first unit development on Yuma Mesa, where considerable progress was made in planting to citrus fruits. Extensive studies were made of further development on the Colorado River for use in Arizona and other States.

The Orland project in California continued in successful operation and some additional lateral canals were lined with concrete to conserve the water supply. The water users continued their splendid record of complete payment of irrigation charges, but at the close of the fiscal year the water supply was exhausted and the project faced an unprecedented shortage, curtailing prospective yields for the season of 1924 and temporarily endangering the unbroken record of payment. In cooperation with the State of California and local interests investigations were continued in Sacramento Basin and the bureau was represented on a board making a study of several California streams as to uses for power and other purposes.

In Colorado the Government continued to operate the Grand Valley and Uncompahgre projects, the latter under public notice, requiring installment payments of construction cost, the former on a basis of water rentals for the annual service without repayments on the capital investment. Reconstruction continued on the Orchard Mesa system, first built under private auspices and after failure taken over by the bureau as an extension of the Grand Valley project. Colorado investigations included the Badito project, the upper White River, and the Rio Grande.

In Idaho the bureau operated the Boise, King Hill, and Minidoka projects except that the Minidoka irrigation district continued to handle the operation and maintenance of the Gravity division on the last named project. On the Boise project the Black Canyon Dam was brought sufficiently near to completion to permit diversion of water to existing canals of the Emmett irrigation district. Government operation of the King Hill project has been carried on under contracts providing for this until the close of 1924 when the management may, at their option, be assumed by the water users organized as the King Hill irrigation district. Looking toward the extension of the Minidoka project and additional development on Snake River preliminary operations were continued at the site of the large dam projected to cross the stream at American Falls, where negotiations were continued for flowage rights and construction of municipal improvements were under way in the new town site made necessary because the reservoir will flood much of the old town. The extension of the work in Snake River Valley is favored by the fact that the Minidoka project has returned to the reclamation fund a larger percentage of its construction cost than any other Government project. The Dubois and Mountain Home projects in Idaho were also investigated.

In Montana the bureau continued operation of the Huntley project under public notice, the Milk River project under water rental, and the Sun River project in part under public notice, and in part on a rental basis, where canals have been built for a considerable acreage, but pending storage insufficient water is available to permit full agricultural development and make possible the return of the cost. This situation calls for additional construction at an early date to relieve the settlers and bring about a return to the reclamation fund of the investment already made. The interstate project on the Yellowstone continued under Government operation for service to lands in Montana and North Dakota. Construction work on the Montana projects was confined to lateral canals, drains, and related features. Extensive repairs were made to the apron of Yellowstone Dam.

The interstate project on the North Platte River was operated by the bureau for the benefit of lands in Nebraska and Wyoming. The Interstate division north of the river was served on a public notice basis, while water was delivered on a rental basis south of the river where the Fort Laramie Canal is still under construction though serving some lands. The excavation of this canal in open channel was completed, laterals were built for 25,000 acres, and good progress was made in driving tunnel No. 3 and in building the canal structures. The third, smaller division of the project, was completed and operated under contract with the Northport irrigation district. Farther east in the same basin the Tri-County project was studied and a report made.

In Nevada the bureau continued to operate on a public notice basis the Newlands project, which takes water from two streams, the Truckee and Carson. A small part of the project dependent solely on the Truckee has experienced numerous water shortages and the most acute of these occurred in 1924. In a very trying situation that ensued the project management labored indefatigably and tactfully. Arrangement was made to secure additional water by pumping from Lake Tahoe. Investigations were continued for possible additional storage in the Truckee Basin to relieve these lands and extend the project. A system of deep open drains was completed during the fiscal year to the extent provided by a contract with the irrigation district.

On the Pecos River in New Mexico the bureau continued the operation of the Carlsbad project on a public notice basis, involving repayment of operating expense and construction charges, which have returned a third of the first cost on this project. Additional possibilities of using Pecos River were investigated by the bureau and a commission to study the interstate aspect of the river was formed with representatives of New Mexico, Texas, and the United States. The bureau also made investigations on the Penasco and the San Juan.

On the Rio Grande the bureau continued operation, maintenance, and construction work on the Elephant Butte project that is interstate and international because some of the water stored by the bureau is delivered to Mexico under treaty. Substantial progress was made toward completion of the drainage and lateral systems of the American project. Based on the profits of previous years a large area on the project was planted to cotton and returns from this and other products

almost doubled the gross crop value per acre. Repayment to the bureau of construction installments and operating costs was promptly made by the two large irrigation districts embracing New Mexico and Texas lands.

The Williston project in North Dakota was operated, but has not paid expenses, and it is of such small importance that if its operation is continued it should be as a private project. Its appraisal and sale were recommended by the advisory board.

In Oregon the bureau continued operation of the Umatilla project under public notice and supplemental construction on lateral system, canal lining, and drainage works. Active construction was in progress on McKay Dam for extension of the project. The Klamath project lying across the Oregon-California line was operated by the bureau under public notice and additional irrigation facilities built in Langell Valley and the bed of Tule Lake, which has been exposed for irrigation by the project operations. A number of projects of interest to Oregon were investigated during the year.

The Belle Fourche project in South Dakota was operated on a public-notice basis, but extraordinary rainfall greatly curtailed the demand for water during the season of 1923 and only about 40 per cent of the lands were irrigated that year.

In Utah the bureau continued to operate the major works of the Strawberry Valley project under public notice and contracts, delivering water in bulk at the headgates of various canal companies and irrigation districts. The Mapleton and Springville districts continued their unbroken record of repaying the Government according to schedule. Extended investigations have been carried on in Utah to select a suitable project for next development.

In Washington the Okanogan project was operated under public notice. This project, like the Orland, depends on a relatively small catchment and is subject to water shortages when the snowfall is light. Resort has been had in recent years to pumping and additional canals were lined to conserve the available water supply. Owing to drouth additional water had to be acquired and pumped. Credit is due the project management for its tireless and effective work throughout the emergency. The Yakima project was operated on a public-notice basis and the construction of the Tieton Reservoir was 80 per cent completed at the close of the fiscal year, providing additional storage water the use of which depends on construction of additional canal systems. Four prospective extensions have been studied and in October a board of engineers recommended the Kittitas division for first development. Any extension will involve very expensive work, but in support of such expenditures it is pointed out that the Yakima project is a distinct success, having returned to the reclamation fund a larger sum than any other project.

Under a special act of Congress the investigation of the Columbia Basin project, previously begun by State agencies, was carried on by the bureau, and as the fiscal year closed further study was contemplated with the Federal appropriation which continued available.

In Wyoming the Riverton project, which has involved heavy construction before making water available for any land, was brought to a point where lighter work will successively extend the system to units of the irrigable lands. The Shoshone project was continued in operation for the delivery of water to the Garland and Frannie

divisions north of the river, while construction included extension of the project drainage and completion of diversion works and sufficient canals to make water available next year for some of the new Willwood division south of the river.

### FINANCES

The consolidated financial tables, Nos. 1 to 18, inclusive, followed by tables for individual projects, printed in the Appendix, pages 98 to 163, reflect the financial transactions during the fiscal year 1924, and the financial condition of the bureau on June 30, 1924.

During the fiscal year an investigation was made, under direction of the Secretary of the Interior, of the accounting practices of the bureau, and an audit made of the financial accounts. The results of the audit are contained in a report to the Secretary under date of February 20, 1924. As a result of the investigation and reorganization, some changes have been made in the form of financial statements in this report from those published in the twenty-second annual report. However, to preserve the continuity of the financial data, reconciliations have been made to "tie-in" the financial data herein published with those published in the twenty-second annual report.

During the fiscal year the Indian projects—Blackfeet, Flathead, and Fort Peck—were turned over to the Bureau of Indian Affairs. No financial data are included in this annual report for these Indian projects.

### FUNDS

Various funds have been made available for reclamation work. A discussion of each fund is published in previous annual reports. These funds are as follows: Reclamation fund; Yuma auxiliary fund; general investigations, Reclamation Service, 1923—December 31, 1924; increase of compensation, Rio Grande Dam appropriation; judgments, Court of Claims; Wind River Indian (Riverton); drainage and cut-over.

The financial transactions for all funds, excepting Yuma auxiliary, drainage and cut-over, general investigations, Reclamation Service, 1923—December 31, 1924, and increase of compensation applied to these appropriations, are consolidated in the general financial statement, Table No. 1, and other tables. The exceptions are classed as separate financial units, while the consolidated statements cover "reclamation fund" projects only, i. e., projects constructed and operated from the reclamation fund.

Table No. 2 is a statement of the transactions during the fiscal year of those funds which were active. Summary of Table No. 2 is as follows:

Reclamation fund:			
Balance July 1, 1923.....	\$4,649,267.46		
Receipts fiscal year 1924.....	13,155,400.70		
		\$17,804,668.16	
Expenditures, not including liabilities.....		12,333,021.44	
Balance on hand, June 30, 1924.....		5,471,646.72	
Yuma auxiliary fund:			
Balance July 1, 1923.....	76,536.78		
Receipts fiscal year 1924.....	43,391.46		
		119,928.24	
Expenditures not including liabilities.....		67,637.74	
Balance on hand June 30, 1924.....		52,290.50	

General investigations:		
Balance, July 1, 1923.....	\$258,591.76	
Receipts fiscal year 1924.....	19,177.55	
		\$277,769.31
Expenditures not including liabilities.....		185,782.14
Balance on hand, June 30, 1924.....		91,987.17
Increase of compensation fund:		
Expenditures (net)—		
Applied to reclamation fund.....		282,516.49
Applied to Yuma auxiliary fund.....		1,509.90
Applied to General investigations.....		4,284.29
Total.....		288,310.68

The funds accumulated to June 30, 1924 available for "reclamation fund" projects, are summarized as follows:

Reclamation fund as per Table 3.....		\$125,905,028.21
Other funds:		
Judgments, Court of Claims.....		550,347.58
Rio Grande Dam.....		1,000,000.00
Increase of compensation (net).....		2,759,890.98
Wind River Indian (Riverton).....		359,479.65
		130,574,746.42
Advance from General Treasury.....	\$20,000,000.00	
Less amount repaid.....	4,000,000.00	
		16,000,000.00
Total, Government aid for reclamation of arid land (Table 1).....		146,574,746.42
Plus project collections.....		52,238,213.41
Total available for expenditure.....		198,812,959.83
Less cash on hand:		
Reclamation fund.....	5,471,646.72	
Wind River Indian (Riverton).....	303.61	
		5,471,950.33
Grand total expenditures, not including liabilities (Table 16).....		193,341,009.50

The item of \$52,238,213.41 represents all collections for construction and operation and maintenance repayments, water and other rentals, sales, etc. All of these collections have been credited to the reclamation fund and reexpended within congressional limitations.

Table No. 3 is an analysis of the accretions to the reclamation fund by sources and States, except proceeds from Federal power licenses, no information being available as to the States from which this fund came.

#### CONSTRUCTION COST AND REPAYMENTS

Table No. 4 gives, for the fiscal year and to date, the construction cost of irrigation works, other cost reimbursable with construction, less the construction revenues, contributed funds, nonreimbursable and abandoned costs, showing as a result the balance to be repaid by the project water users. Table No. 5 is a statement of contracts which are of book record to secure repayment of costs. Table No. 10 is a statement of the amounts due (including contributed fund) under repayment contracts, amounts collected and uncollected.

#### OPERATION AND MAINTENANCE RESULTS

Tables 6 and 7 are statements of the operation and maintenance results for the calendar year and to December 31, 1923. Tables 8 and 9 are similar statements for the fiscal year and to June 30, 1924. As the operation and maintenance year corresponds to the calendar year, the results as shown by Tables 6 and 7 are the better results of the operation and maintenance of the projects, while the results

shown by Tables 8 and 9 include costs for the first 6 months of the calendar year which are not offset by earnings. Operation and maintenance returns for the entire year are accrued at the end of the operation and maintenance year. Table No. 11 is a statement showing the status of the operation and maintenance charges due, collected and uncollected.

#### MISCELLANEOUS ACCOUNTS

Tables 12, 13, 14, and 15 are statements showing the status of various miscellaneous amounts due in connection with miscellaneous operations such as rentals of irrigation water, power and lights, rentals of grazing and farming lands, etc.

A summarization of Tables 10 to 15 is as follows:

	Due to June 30, 1924	Collected to June 30, 1924, cash and other credits	Uncollected June 30, 1924
Construction charges.....	\$21, 145, 422. 79	\$17, 720, 000. 30	\$3, 425, 422. 49
Operation and maintenance charges.....	15, 619, 065. 30	13, 117, 405. 60	2, 501, 649. 70
Rentals irrigating water.....	7, 521, 829. 82	7, 811, 056. 67	210, 773. 15
Rentals power and light.....	2, 833, 743. 42	2, 801, 342. 18	32, 401. 24
Rentals grazing and farming lands.....	825, 376. 74	806, 512. 24	18, 864. 50
Uncollected operation and maintenance penalties.....			1, 950. 25
Uncollected miscellaneous charges.....			167, 740. 66
Total uncollected.....			6, 358, 801. 99

Table 16 is an investment statement showing the expenditures, collections, and net investment for the year and as of June 30, 1924. The net investment for a project represents the expenditures made on behalf of the project less the amount actually returned by the project. The net investment of the United States in reclamation fund projects as of June 30, 1924, is \$141,102,796.09. The amounts in the column "Expenditures" represent disbursements from increase of compensation, etc., as well as from the reclamation fund. The statement at the bottom analyzes the total by funds.

The total collections creditable to the reclamation fund for the year were \$5,743,835.71 and to date \$52,238,213.41. A comparison of collections during the past few fiscal years is as follows:

1918.....	\$3, 459, 446. 00
1919.....	3, 862, 224. 67
1920.....	4, 911, 882. 83
1921.....	4, 191, 884. 13
1922.....	4, 294, 507. 94
1923.....	5, 143, 928. 22
1924.....	5, 743, 835. 71

Table 17 is a statement of net investments for operations other than in connection with reclamation fund projects.

Table 18 shows the status of congressional appropriations or authorizations for the fiscal year 1924. This table indicates that the expenditures and liabilities for each project came within the amounts authorized by Congress.

Following these consolidated tables in the Appendix are tables giving financial data for individual projects, primary and secondary.

# DISCUSSION OF PROJECTS

## PRIMARY PROJECTS

### ARIZONA, SALT RIVER PROJECT

The land irrigated under the Salt River project is located in Maricopa County, Ariz. Including the Tempe lands, there are 5,500 farms and 12 towns, the total population being 85,000. Averaged over a period of 35 years, the annual rainfall is 8.34 inches and the range in temperature for the period from 22° to 117° F. The soil is sandy loam and silt, and cultivation is carried on throughout the entire year. Farming is highly diversified, but the major crops are cotton, alfalfa, grain, citrus, and deciduous fruits, cantaloupes, vegetables, etc. Local, coast, and eastern markets absorb surplus production.

The water supply of the project consists of the stored water of the Salt River and the uncontrolled flow of the Verde River, supplemented by reserve pumping capacity from underground water within the project. Roosevelt Dam, located on the Salt River just below the mouth of the Tonto, lies within Gila County and stores 1,635,000 acre-feet of water at the level of the top of the Taintor gates in the spillways. Water is discharged into the river channel and diverted into the main canals supplying the areas on the north and south sides by Granite Reef Dam, 30 miles east of Phoenix and about 4 miles below the mouth of the Verde River. Joint Head Dam on the Salt River, about 6 miles east of Phoenix, diverts water to north side canals, which reaches the river by seepage or otherwise below Granite Reef. Including one plant acquired with the Tempe lands and two others purchased, the project now has 12 pumping plants, originally installed for additional water supply, having a combined capacity of 110.4 second-feet, or around 9 second-feet each. In addition, 87 pumping plants with capacities ranging from less than 1 to 11.5 second-feet and an aggregate maximum capacity of 300 second-feet, installed as part of the project drainage system, are to a greater or less degree available as a supplemental source of water for irrigation if needed. The use of surplus pumped water for the development of additional land is encouraged as far as possible. With the exception of 6,000 acres irrigated by pumping from the Western Canal through a 40-foot lift to the Highline Canal, all project lands are irrigated by gravity. The canals and laterals, including the Tempe system and Maricopa Garden Farms ditches, aggregate 937.9 miles in length. The project is also operating 30 additional miles of ditch not part of the project, taken over with the New State and Utah lands. There are 180.62 miles of waste ditches, 15.85 miles of open drain (including the Tempe area), and 5.3 miles of closed drains. Drainage of the project lands at one time presented a serious problem, 30 per cent of the irrigable area being threatened with water logging in 1918. This condition is being successfully controlled with pumps, the aggregate capacity of the 99 plants (including irrigation pumps) being 410.4 second-feet. The project has five power plants, one at Roosevelt, having a capacity of 11,750 k. v. a., and four plants located on the canal system of the valley with an aggregate capacity of 8,910 k. v. a., making a total for the system of 20,660 k. v. a.

### ACTIVITIES DURING FISCAL YEAR

The past year was notable in project development. An area of 23,000 acres of land under the Tempe canal was admitted to the project, bringing with it one of the oldest water rights in the valley. Land under the Utah Canal, 2,300 acres, was admitted on a temporary basis, and a contract approved by the Secretary of the Interior for the admission of 9,600 acres of additional land within the reservoir district, when a water supply shall become available by



the completion of Mormon Flat Development No. 1. New State, St. Johns, and Maricopa Garden Farms lands, aggregating 4,000 acres, were being served with pumped water, increasing by 38,900 acres the total area to be served by the project.

Mormon Flat Development No. 1, for which the water users' association sold \$1,800,000 in bonds last year, and consisting of the addition of 270,000 acre-feet to the capacity of Roosevelt Reservoir by the installation of 15-foot Taintor gates in the spillways, the construction of a new transformer house, and the installation of an additional generating unit of 10,000 horsepower capacity at Roosevelt, with the building of a dam 230 feet above lowest foundation, creating a 92,000 acre-foot regulating reservoir at Mormon Flat, 30 miles below Roosevelt, was 90 per cent complete and will be in operation by the end of the summer.

The board of governors and council of the association approved the construction of a 300-foot dam and 40,000 horsepower plant at Horse Mesa, midway between Roosevelt and Mormon Flat, and the shareholders voted on the issuance of bonds for this project on July 29. The total cost of the Horse Mesa development is estimated at \$4,400,000. The market for surplus power was assured in advance by contract covering the entire output for 25 years. The new South Consolidated power plant was completed during the year and was in operation with double the output of the old plant. Water was supplied to the Consolidated Canal through this power plant with a drop of 40 feet from the enlarged Eastern Canal. Four miles of the Consolidated above the new power plant, a considerable part of which, adjacent to the Salt River, was constantly menaced by floods, may now be abandoned.

The waste ditch program, providing surface drainage at the low corner of each quarter section of the project was 80 per cent complete. During the past year 25.62 miles of new waste ditches were constructed; 51 miles of canals and laterals were taken over with the Tempe, 16 with the Utah, 14 with the New State, and 7 with the Maricopa Garden Farms lands; 7.85 miles of new laterals were constructed, making a total of 95.85 miles to be added to the distribution system operated by the project; 11 miles of open drains were taken over with the Tempe project.

The effectiveness of drainage of water-logged land by pumping has been thoroughly demonstrated. During the year 28 new pumping plants were undertaken, 16 of which are located in the Tempe area. Nine were in operation and drilling had been completed on the remainder. A ditch was virtually completed from the end of the Tempe drain to the Gila River, 10.79 miles. With the early completion of this and with the remainder of the pumping plants mentioned, the drainage problem of the project will be virtually under control.

*Operation and settlement data, Salt River project*

Item	1920-21	1921-22	1922-23	1923-24
Acreage for which works were prepared to supply water.....	213,000	213,168	213,170	213,170
Acreage irrigated.....	205,080	203,344.60	204,590.60	204,590
Miles of canals operated.....	852.75	863.35	863.35	867.9
Water diverted (acre-feet).....	<sup>1</sup> 1,371,983	1,231,031	<sup>1</sup> 1,215,033	<sup>1</sup> 1,075,150
Water delivered to land (acre-feet).....	594,615	534,526.07	566,715	590,613
Acre-feet per acre for area under cultivation.....	2.90	<sup>2</sup> 2.635	<sup>2</sup> 2.770	<sup>2</sup> 2.89
Total number of farms on project (when completed) <sup>4</sup>	4,700	5,000	5,000	5,600
Number of farms reported <sup>4</sup>	4,200	5,000	5,000	5,500
Operated by owners or managers <sup>4</sup>				4,600
Operated by tenants <sup>4</sup>				900
Population <sup>3</sup>	31,600	33,600	36,000	36,000
Number of towns.....	14	14	14	12
Population.....	39,795	42,500	44,000	51,000
Total population of towns and farms.....	71,395	76,100	80,000	87,000
Number of public schools.....	57	60	60	63
Number of churches.....	62	65	65	65
Number of banks.....	20	20	20	15
Total capital stock.....	\$1,752,500	\$1,755,500	\$1,755,500	\$1,600,000
Amount of deposits.....	\$24,426,057	\$17,776,336	\$21,331,600	\$25,000,000
Number of depositors.....	35,000	38,000	39,500	40,000

<sup>1</sup> Includes 307,455 acre-feet wasted; water for Salt River Valley Water Users' system only; outside water deducted.

<sup>2</sup> Net Salt River Valley Water Users' Association, inclusive of 185,000 acre-feet flood water diverted for power.

<sup>3</sup> Amount of water per acre actually charged for; 20 per cent less than the amount of water delivered to the land.

<sup>4</sup> Estimated.

<sup>5</sup> Includes population within town-site areas.

**ARIZONA-CALIFORNIA, YUMA PROJECT**

The Yuma project, exclusive of the Mesa division, comprises 65,000 acres of irrigable land for a distance of 38 miles from the boundary between Arizona and Mexico, in Yuma County, Ariz., and Imperial County, Calif. The water supply is diverted from the Colorado River at Laguna Dam 13 miles northeast of Yuma on the California side, and is carried under the river at Yuma by an inverted siphon. The limit of area of farm units is 40 acres. The duty of water averages 3 acre-feet at the farm. The soils are rich alluvium bottom land. The principal crops are cotton and alfalfa. The irrigation season is 365 days. The average temperatures for 29 years are: High, 115°; low, 28° F.; rainfall, 40-year average, 3.1 inches.

The Mesa division comprises about 45,000 acres of mesa land lying about 80 feet above the valley. The soil is sandy and the climate frostless and well adapted to the growing of citrus and other semitropical fruits. Water is to be supplied by pumping. The first unit of 6,300 acres is now being developed.

**ACTIVITIES DURING FISCAL YEAR**

Construction work consisted of the extension of the drainage system; 3.5 miles of open drains were dug, involving the moving of 73,800 cubic yards of earth. Extensive repairs were made to Laguna Dam. The necessity for this was due to the Colorado River shortening its channel between the dam and Yuma in 1920. This work consisted in placing 33,700 cubic yards of rock and 480 cubic yards of paving on the lower toe of the dam; 1,460 cubic yards of concrete, made into blocks of 2 cubic yards each, were placed as riprap below the sluiceways; the excavation amounted to 25,800 cubic yards.

The lateral system was cleaned by 4 to 6 Ruth ditch cleaners; 293.6 miles of canals and laterals were cleaned, involving the moving of 435,300 cubic yards of silt. From 1 to 3 draglines cleaned silt and sand from the drainage system; 19.5 miles of drains were gone over, which required the moving of 103,000 cubic yards.

The year was very successful for the water users. Better yields of nearly all of the main farm commodities were obtained and good prices were paid for most of the crops grown. During the crop year 1923 better farming methods were practiced and the results obtained were so much more satisfactory that the season of 1924 opened with a greater effort being made to obtain a better seed bed, all of which is leading to a much better class of farming with very encouraging results. Much more interest has been taken by the farmers in supporting their marketing organization. Because of the higher prices for cotton, the movement for the diversification of crops and the development of dairying made slow progress. Growing winter lettuce has been tried for the last two years with rather indifferent results. Some good results were obtained in growing watermelons for market.

The citrus plantings of 1923 on the Mesa division made excellent progress. New plantings in the spring of 1924 of 125 acres were not so large as desired, but the character of the development has been such that it is laying a good foundation for a healthy development later. Some new settlers have come into the project, but as a rule these have replaced the less successful farmers. There has been very little subdividing of the larger holdings. This matter, however, is to be pushed during the coming year and all interests are cooperating in that movement.

*Operation and settlement data, Yuma project*

Item	1919	1920	1921	1922	1923 <sup>1</sup>
Area for which bureau was prepared to supply water.....	70,000	65,000	65,000	67,200	<sup>1</sup> 71,000
Acreage irrigated.....	53,284	54,550	52,400	53,970	<sup>1</sup> 53,925
Miles of canal operated.....	323.2	323.2	323.2	345	370.26
Water diverted (acre-feet) <sup>4</sup> .....	478,185	468,900	482,000	546,634	672,867
Water delivered to land (acre-feet).....	155,417	160,330	140,900	140,066	154,271
Acre-feet to acre for area under cultivation.....	2.9	2.94	2.69	2.59	2.90
Total number of farms on project (when completed).....	5,190	5,750	5,750	5,750	5,750
Number of irrigated farms.....	1,225	1,230	1,211	<sup>5</sup> 1,216	1,207
Operated by owners and managers.....	723	711	825	762	675
Operated by tenants.....	502	519	386	453	532
Population.....	5,000	5,100	4,800	4,200	3,800
Number of towns.....	6	6	5	5	5
Population.....	7,600	7,110	6,665	6,700	5,730
Total population of towns and farms.....	12,600	12,210	11,465	10,900	9,530
Number of public schools.....	18	<sup>6</sup> 15	16	16	16
Number of churches.....	11	23	<sup>7</sup> 23	<sup>7</sup> 24	<sup>7</sup> 24
Number of banks.....	6	6	5	5	5
Total capital stock.....	\$255,000	\$255,000	\$230,000	\$280,000	\$280,000
Amount of deposits.....	\$1,923,287	\$2,100,000	\$1,927,000	\$3,095,800	\$3,378,330
Number of depositors.....	5,288	9,175	5,900	6,382	6,970

<sup>1</sup> Includes Yuma mesa lands.

<sup>2</sup> Project proper, 63,163 acres under public notice; 57,500 acres covered by crop census.

<sup>3</sup> Project proper, 53,270 acres.

<sup>4</sup> Of the water diverted, from 100,000 to nearly 200,000 acre-feet each year are wasted, of which the largest part flows into the Colorado River at the California spillway near Yuma, and this water can be diverted for irrigation farther down the river.

<sup>5</sup> A few farms operated partly by owners and partly by tenants.

<sup>6</sup> Reduction due to consolidation.

<sup>7</sup> Religious organizations; figures prior to 1920 relate to church buildings only.

## CALIFORNIA, ORLAND PROJECT

The Orland project is located in Glenn and Tehama Counties, with reservoir in Colusa County. Stony Creek, the source of the water supply, has a drainage area of 735 square miles above the project diversion dams; the mean seasonal run-off near Fruto is 438,500 acre-feet.

The average elevation above sea level is 250 feet; the mean seasonal rainfall, 17.8 inches; and the temperature range, 21° to 114° F. The soil is sandy and gravelly loam, silt loam, and clay loam. The principal products are alfalfa, milo, citrus, and other fruits, nuts, and vegetables. The limit of area of farm units is 40 acres, except that original subscribers are qualified to hold up to 160 acres.

The irrigation plan provides for storage at East Park Reservoir on Little Stony Creek with a feed canal 7 miles long connecting the reservoir with Stony Creek. For the irrigation of project lands located in the vicinity of Orland water is diverted from Stony Creek by two diversion weirs into the South and North Canals, which serve 14,600 and 6,100 acres of land, respectively. Stored water from the reservoir is conveyed in the natural channel of Stony Creek to the project diversions. The distribution system consists of 2,000 structures and 146 miles of canals and laterals, 90 miles of which are concrete lined. The plan also includes a high-line canal, from which power may be developed for pumping.

#### ACTIVITIES DURING THE FISCAL YEAR

The principal construction work consisted of the virtual completion of placing lining under supplemental construction to the extent of funds available from revenues originating from the supplemental charge of \$11 per acre. Expenditures, amounting to approximately \$30,000, were utilized in placing 72,771 square yards of lining on 10.3 miles of laterals.

Although the rainfall was somewhat less than normal, the project system was able to deliver slightly over 3 acre-feet per acre to the land under irrigation notwithstanding the fact that the late natural flow of Stony Creek was not as sustained as usual, which necessitated draft on storage about 30 days earlier than expected.

Settlement on the project, as reflected in the area irrigated and cropped and the irrigable acreage of farms irrigated, was quite satisfactory, these items being larger in amount than for any previous year. The irrigable area of 16,898 acres contained in the farms under irrigation during 1923 comprised 84 per cent of the total irrigable acreage of the project and represented a substantial increase of 466 acres over the previous year. The difference between the irrigated and cropped areas for 1923 was less than for the two preceding years, indicating that more of the land which was levelled and irrigated was being brought into a producing state. Considering the general depression prevalent in the agricultural industry throughout the country as a whole, satisfactory increases during the year were evident in population, number of farms irrigated, crop values, and land investment.

Orchard crops are assuming an increasing percentage of the total value of the crops produced on the project, there being a notable increase in both yield and value for almonds and prunes during the year. Dairying operations continued on a large and profitable scale. The value of the project dairy herds for 1923 exceeded that for any previous year of the project's history.

*Operation and settlement data, Orland project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	20,533	20,533	20,657	20,665	20,670
Acreage irrigated.....	15,203	13,872	14,697	15,119	15,500
Miles of canal operated.....	138	138	146	146	146
Water stored (acre-feet).....	51,000	62,000	13,680	63,460	36,250
Water diverted (acre-feet).....	72,000	33,800	68,867	76,632	73,191
Water delivered to land (acre-feet).....	45,000	20,000	44,200	50,589	47,363
Per acre of land irrigated (acre-feet).....	2.95	1.49	3.01	3.34	3.06
Total number of farms on project.....	846	908	936	965	988
Population.....	2,250	2,200	2,250	2,275	2,300
Number of irrigated farms.....	602	644	663	693	708
Operated by owners or managers.....	549	592	589	568	569
Operated by tenants.....	53	52	74	125	134
Population.....	1,768	1,844	1,892	1,909	1,945
Number of towns.....	1	1	1	1	1
Population.....	1,700	1,700	1,700	1,700	1,700
Total population.....	3,950	3,900	3,950	3,975	4,000
Number of public schools.....	10	10	10	10	10
Number of churches.....	7	7	7	7	7
Number of banks.....	2	2	2	2	2
Total capital stock.....	\$141,000	\$171,000	\$171,000	\$171,000	\$171,000
Amount of deposits.....	\$1,100,000	\$1,020,000	\$996,000	\$998,000	\$1,107,000
Number of depositors.....	3,000	2,900	2,800	2,900	3,000

<sup>1</sup> Includes 320 acres of vested water rights and 46 acres of town and school sites.

<sup>2</sup> Includes 320 acres of vested water rights and 162 acres of school and town sites.

<sup>3</sup> Includes 320 acres of vested rights and 171 acres of school and town sites.

**COLORADO, GRAND VALLEY PROJECT**

The Grand Valley project is located in Mesa County, Colo., on the main line of the Denver & Rio Grande Western Railroad. The principal project towns and estimated population are Grand Junction, 10,000; Fruita, 1,200; and Palisade, 900.

The irrigation plan provides for the diversion of water from the Colorado River by means of a dam about 8 miles northeast of Palisade, Colo., into a canal system on the north side of the river for the irrigation of 45,000 acres of land along the north boundary of the Grand Valley. When the project is completed about 35,000 acres will be supplied by gravity and 10,000 acres by electrically operated pumping plants to be located on the gravity canal. Water service is also furnished through the project system to 8,400 acres of land in the Palisade and Mesa County irrigation districts, and works are now under construction to supply the Orchard Mesa irrigation district, which includes 10,000 acres of land on the south side of the valley, known as the Orchard Mesa pumping division.

The average elevation of the irrigable area is 4,700 feet, the average annual rainfall is 8.3 inches, and the average range of temperature is from 99° to -7° F. The soils consist of red mesa, sandy loam, and adobe. The principal crops are alfalfa, sugar beets, grain, corn, fruit, potatoes, and vegetables.

The project has been completed far enough to supply 30,000 acres in the Gravity division, all lands in the Palisade and Mesa County irrigation districts, and 4,000 acres in the Orchard Mesa irrigation district. No lands have been opened under public notice, and the project is now operated on a rental basis.

**ACTIVITIES DURING FISCAL YEAR**

*Gravity division.*—The principal construction work was the digging of drains necessary to maintain the productivity of the lands under cultivation. Three dragline excavators completed 6.5 miles of open drains involving 166,348 cubic yards of excavation.

*Orchard Mesa pumping division.*—The work of reconstructing the irrigation system of the Orchard Mesa irrigation district and of constructing drains as provided in the contract dated February 18, 1922, was continued during the year. The principal features completed were: 4,017 linear feet of concrete flume 17 feet 3 inches wide by 8 feet deep of 800 second-feet capacity; 1,352 linear feet of covered conduit 11 feet by 11 feet 3 inches; one concrete siphon 12 feet in

diameter; two short flumes; one section of earth canal and embankment to replace a wooden flume; and the relining of the tunnel on Canal No. 1. On the drainage system 3.6 miles of open drains were completed, involving 81,854 cubic yards of excavation. At the close of the fiscal year the entire job, which involves an expenditure of \$1,000,000, was about 50 per cent complete.

Weather conditions were favorable during the season of 1923 and crop yields were generally satisfactory. Improved market conditions and higher prices resulted in a more optimistic feeling among most of the project farmers. The average crop yield for the season was \$46.25, an increase of 50 per cent over the previous year. Little progress in settlement and development was noted during the season of 1923, but in the spring of 1924 there was a good demand for lands of the better class, and a number of new settlers were brought to the project, principally through the activities of the Holly Sugar Corporation.

*Operation and settlement data, Grand Valley project*

Item	1919	1920	1921	1922	1923
Acres for which bureau is prepared to supply water.....	1 38,400	1 38,400	1 38,400	1 38,400	1 48,400
Acres irrigated.....	1 18,449	1 19,484	1 20,590	1 20,672	1 23,770
Miles of canals operated.....	175	175	175	175	175
Water diverted, acre-feet.....	1 133,364	1 142,527	1 145,416	1 166,404	1 247,267
Water delivered to land, acre-feet.....	1 38,307	1 36,024	1 43,978	1 46,290	1 48,526
Per acre of land irrigated.....	1 3.81	1 3.07	1 3.57	1 3.74	1 3.77
Total number of farms on project.....	900	825	825	825	825
Population.....	884	1,019	1,064	1,134	1,185
Number of irrigated farms.....	324	376	402	387	396
Operated by owners or managers.....	201	251	264	217	229
Operated by tenants.....	123	125	138	170	167
Population.....	884	1,019	1,064	1,134	1,185
Number of towns.....	6	6	6	6	6
Population.....	11,266	11,415	11,246	11,246	11,246
Total population in towns and on farms.....	12,150	12,434	12,310	12,380	12,431
Number of public schools.....	22	23	23	24	24
Number of churches.....	28	28	28	28	28
Number of banks.....	7	7	7	7	6
Total capital stock.....	\$432,000	\$465,000	\$465,000	\$468,700	\$462,300
Amount of deposits.....	\$3,743,714	\$3,259,780	\$3,621,420	\$3,520,500	\$3,237,000
Total number of depositors.....	10,042	10,150	10,975	8,825	9,850

- 1 Includes data for Palisade and Mesa County irrigation districts.
- 2 Includes data for Orchard Mesa, Palisade and Mesa County irrigation districts; project proper, 30,000 acres to which bureau could supply water; 12,870 acres irrigated.
- 3 Project lands only.
- 4 Estimated.
- 5 These items include areas adjacent to project.

COLORADO, UNCOMPAGHGRE PROJECT

The Uncompahgre project is in southwestern Colorado, in Montrose and Delta Counties, on the Denver & Rio Grande Western Railroad. The project towns and population are Montrose, 4,000; Olathe, 750; and Delta, 2,700.

The irrigation plan provides for the diversion of water from the Gunnison River by means of the Gunnison Tunnel, 5.8 miles long, and the South Canal, 11.7 miles long, to supplement the flow of the Uncompahgre River for the irrigation of lands in the Uncompahgre Valley. To distribute the waters of the Uncompahgre and Gunnison Rivers thus combined, the more important private canals taking water from the Uncompahgre River have been purchased, enlarged, and extended by the Government, and in addition high-line lateral and other systems have been constructed on each side of the valley.

The irrigation season extends generally from April 1 to October 31, 214 days, in all Government canals.

The average elevation of the irrigable area is 5,500 feet above sea level; the average annual precipitation on the project for 22 years, 9.50 inches; and the average range of temperature, 10° to 95° F.

The soils of the irrigable area are red sandy gravel, adobe, and clay loams. The principal products are alfalfa, grain, sugar beets, potatoes, onions, fruits, and other vegetables.

The principal markets are Denver, Omaha, Kansas City, and the West for livestock; Denver, Missouri River points, and Texas for fruit, potatoes, and onions.

The project is completed with the exception of the acquisition of a few private laterals.

### ACTIVITIES DURING FISCAL YEAR

Construction work consisted in the extension, enlargement, and installation of minor structures on private laterals taken over by the bureau to be operated as part of the project system.

Owing to the agricultural depression of the past three years no change has taken place in settlement conditions on the project during the past fiscal year. There was, however, an increase in the number of farms irrigated, which was due to the tendency to subdivide larger holdings.

The general crop return was an improvement over that of 1922 and averaged \$34.76 per acre. The yields of the principal crops were close to the average with the exception of alfalfa hay, which was 18 per cent less, and onions, which were 20 per cent more than the average.

The project has recovered to a considerable extent from the agricultural depression which resulted from the disastrous year of 1922.

The railroad furnished excellent service during 1923 and promises the same for 1924. This is a most vital feature in the development of the project and the recent service furnished has done much to encourage the farmers in the future of the project. The Potato Marketing Association functioned quite successfully during their first year's operation. Denver banking facilities are now available for financial purposes during future years.

### Operation and settlement data, Uncompahgre project

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water	100,000	100,000	97,410	97,410	97,000
Acreage irrigated	60,906	64,180	63,760	64,730	64,320
Miles of canal operated	442	448	452	467	489
Water diverted (acre-feet)	420,176	429,820	446,225	427,706	439,452
Water delivered to land (acre-feet)	390,770	365,853	415,599	422,398	336,877
Per acre of land irrigated (acre-feet)	6.42	5.70	6.52	6.52	5.11
Total number of farms on project	2,000	2,000	2,000	2,000	2,000
Population	5,471	6,015	6,166	6,149	6,097
Number of irrigated farms	1,526	1,588	1,639	1,624	1,694
Operated by owners or managers	1,012	1,077	941	944	962
Operated by tenants	514	511	698	680	732
Population	5,471	6,015	6,166	6,149	6,097
Number of towns	3	3	3	3	3
Population	6,950	7,450	7,450	7,450	7,450
Total population in towns and farms	12,421	13,465	13,616	13,599	13,547
Number of public schools	27	27	27	27	26
Number of churches	27	27	27	27	27
Number of banks	8	8	8	7	6
Total capital stock	\$594,025	\$621,763	\$618,250	\$550,100	\$505,136
Amount of deposits	\$5,550,465	\$4,925,150	\$3,219,773	\$2,930,700	\$3,232,696
Number of depositors	11,000	11,000	11,000	11,250	11,250

<sup>1</sup> Decrease due to reclassification.

## IDAHO, BOISE PROJECT

The Boise project is located in the counties of Ada, Boise, Canyon, and Elmore, Idaho; and Malheur, Oreg. It is served by the Oregon Short Line Railroad and branch lines; also the Idaho Traction and Caldwell Traction Co. electric lines. The length of the irrigation season is 184 days from April 5. The average elevation of the irrigable area is 2,500 feet above sea level. The rainfall at Boise for 60 years averaged 13.41 inches. The greater part of this precipitation occurs outside of the growing season. The average highest recorded temperature for 25 years is 102° F., and the average lowest temperature for the same period is 2° F. The character of the soil is clayey loam, light sandy loam, and sandy loam. The principal products are alfalfa, wheat, oats, clover, potatoes, apples, prunes, and head lettuce. The principal markets are Boise, Nampa, Caldwell, and Meridian, Idaho; Portland, Oreg., and eastern cities. The limiting area of farm units on public land is 80 acres, and on private land 160 acres.

The irrigation plan provides for storage of water in the Arrowrock Reservoir on Boise River, about 22 miles above Boise, and in the Deer Flat Reservoir near Caldwell and Nampa, Idaho; the diversion of water from Boise River by the Boise River Dam, about 8 miles above Boise; the distribution of water on the south side of the Boise River, through the Main Canal, leading from the dam to the Deer Flat Reservoir; distributing laterals heading in the Main Canal; distributing canals heading in the Deer Flat Reservoir; and distributing canal systems heading in the Boise River below the Boise River Dam; and the distribution of water on the north side of the Boise River to a small area of land east of Boise through a canal system heading in the Boise River Dam. Water is diverted from two large drains in the Pioneer irrigation district and carried through a gravity canal across the Boise River near Caldwell to supply 6,800 acres in the Notus division.

Water is also diverted from the Payette River by means of a concrete diversion dam located at Black Rock Canyon about 6 miles above Emmett, Idaho. This dam is required for the irrigation of 22,500 acres in the Emmett irrigation district, and upon the construction of a distribution system therefor will also be available for the diversion of water from the Payette River for 56,000 acres in the Black Canyon district. Power will also be developed in connection with the dam, which it is proposed to use temporarily in connection with the pumping requirements of the Gem irrigation district and eventually when these lands are placed under a gravity supply, for increasing the irrigable area in the Black Canyon district.

## ACTIVITIES DURING FISCAL YEAR

On the Main South Side Canal, Arrowrock division, concrete side lining amounting to 1,000 feet was placed to protect a stretch where the canal skirts the Boise River. About 34½ miles of deep drains were completed involving the excavation of 1,667,000 cubic yards of class 1 material and the placing of 237 cubic yards of concrete with 5,046 feet of concrete pipe and 264,000 feet b. m. of lumber.

The removal of silt from canals and laterals required an expenditure of 13.7 per cent of the total cost of operation and maintenance. A Ruth ditch cleaner was used to clean 38 miles of canals and laterals. Fifty miles of canals and laterals, counting actual length excavated, were cleaned by teams.

The Black Canyon Dam on the Payette River at Black Rock Canyon, which makes possible the elimination of 16 miles of very difficult canal location for the Emmett irrigation district, was virtually completed and was placed in operation during the year. This dam which has a maximum height of 183 feet and contains approximately 80,000 cubic yards of concrete, in connection with pumping facilities also completed, furnishes water to the lands of the Emmett irrigation district, and is also available for lands which later will come under irrigation in the Black Canyon district and for the development of 12,000 horsepower required for pumping irrigation water.



Settlement is not and has never been a serious problem of the Boise project. During the last year there have been few changes affecting settlement. The number of tenant farmers has been slightly decreased. Little land has been sold. Transfers made were mostly in the interest of adjustment of loans or trades.

Crop conditions were especially good and yields were large. Alfalfa hay comprised 35 per cent of the cropped area. The yield of wheat was high and the acreage amounted to 25 per cent of the total. There was an increase in the acreage of corn which ranked third in area. A heavy yield of all fruits was harvested, but market conditions were adverse. Records indicated a general increase in livestock. Dairy cattle showed a normal increase, and there was a large increase in the number of hogs on project farms.

*Operation and settlement data, Boise project, Idaho, by calendar years*

Item	1919	1920	1921	1922	1923
Acreage to which bureau was prepared to furnish water.....	1 274, 125	1 274, 379	1 282, 831	1 283, 411	1 283, 471
Acreage irrigated.....	1 125, 000	1 121, 760	1 153, 000	1 155, 000	1 155, 800
Miles of canal operated.....	989	1, 000	1, 016	1, 056	1, 019
Water diverted (acre-feet).....	759, 084	853, 810	844, 195	748, 570	896, 703
Water delivered to land per acre of land irrigated (acre-feet).....	3.34	3.00	3.67	3.46	2.70
Total number of farms on project.....	3, 992	4, 000	4, 085	4, 998	5, 006
Population.....	15, 000	16, 000	16, 340	14, 700	14, 650
Number of irrigated farms.....	3, 207	3, 260	3, 300	3, 559	3, 000
Operated by owners or managers.....	2, 545	2, 417	2, 440	2, 896	2, 988
Operated by tenants.....	662	843	860	663	612
Population.....	10, 000	11, 176	11, 550	14, 236	10, 800
Number of towns.....	10	10	8	8	8
Population.....	40, 000	36, 400	36, 170	36, 170	36, 270
Total population in towns and on farms.....	55, 000	52, 400	52, 510	50, 570	50, 920
Number of public schools.....	24	24	23	23	23
Number of churches.....	54	56	56	56	58
Number of banks.....	15	17	16	16	14
Total capital stock.....	\$2, 000, 000	\$1, 850, 000	\$2, 741, 000	\$2, 741, 000	\$1, 750, 000
Amount of deposits.....	\$13, 500, 000	\$20, 600, 000	\$16, 326, 000	\$16, 707, 000	\$15, 295, 000
Number of depositors.....	28, 000	32, 000	30, 000	30, 000	30, 000

<sup>1</sup> Including partial service to vested water-right land; project proper, 120,300.

<sup>2</sup> Acreage served with full water supply.

<sup>3</sup> 112,500 covered by crop census.

<sup>4</sup> All vested water-right lands excluded with the exception of 21,500 acres of the New York Canal Co.

<sup>5</sup> Estimated; some banks refuse to give number of depositors.

## IDAHO, KING HILL PROJECT

The King Hill project is located in the counties of Elmore, Gooding, Twin Falls, and Owyhee. The estimated population of the four project towns is as follows: Glens Ferry, 1,100; Bliss, 175; King Hill, 175; Hammett, 75. The main line of the Oregon Short Line runs the entire length of the project. The water supply is obtained from the Malad River, which is fed by numerous large springs. The annual run-off is approximately 876,000 acre-feet. The water for the project is diverted from the Malad River at a point about a mile above its confluence with the Snake River, 300 second-feet of water being delivered to the canal system of the project by the Idaho Power Co. by means of a timber flume 4,000 feet long. The main canal is 50 miles long and crosses the Snake River twice by means of wood-stave siphons on steel bridges. About half of the irrigable area lies on each side of the Snake River. There are 16,314 acres supplied by gravity and 574 acres supplied by pumps. The average elevation above sea level is 2,750 feet. During the past 11 years the average annual rainfall was 8.59 inches, the average maximum temperature 107°, and the average minimum temperature 4° F. The soil on the project ranges from light to heavy sandy loam with some heavy clay. With an irrigation season of 193 days, the project produces principally alfalfa, alfalfa seed, potatoes, grains, fruits in favorable seasons, and stock. The project was reconstructed under contract with the King Hill irrigation district. Work was begun in February, 1918, and on June 30, 1923, all work contemplated under the contract was completed.

## ACTIVITIES DURING FISCAL YEAR

At the beginning of the fiscal year 1924, this project was placed on an operation and maintenance basis, as construction had been finished and the force reduced to correspond.

The project was operated by the Bureau of Reclamation during the first part of the fiscal year under contract with the district, which expired November 1, 1923. A supplemental contract was subsequently executed, extending this work through November and December. A new contract providing for operation and maintenance along practically the same lines as the previous contract was entered into January 1, 1924, to cover operation and maintenance by the Bureau of Reclamation during the calendar year 1924, and a toll charge of 50 cents per acre was announced for 1924.

In December, 1923, the King Hill irrigation district requested the bureau to investigate seepage conditions affecting approximately 200 acres, the cost not to exceed \$200, to be repaid with operation and maintenance costs. Borings were put down and readings of ground water elevations taken, but the investigations were not completed. It will be the policy of the district to eliminate this seepage by lining portions of the canal rather than by drainage.

*Operation and settlement data, King Hill project*

Item	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	11,340	13,648	13,648	16,890
Acreage irrigated.....	4,780	5,900	6,440	7,020
Miles of canal operated.....	83.2	83.2	91.3	100.1
Water diverted (acre-feet).....	43,660	56,153	61,328	91,834
Water delivered to land (acre-feet).....	22,420	30,028	35,875	41,933
Per acre of land irrigated (acre-feet).....	4.69	5.08	5.57	5.97
Total number of farms on project.....	225	260	260	260
Population.....	424	557	599	598
Total irrigated farms.....	125	160	175	184
Operated by owners or managers.....	110	141	131	124
Operated by tenants.....	15	19	44	60
Number of towns.....	4	4	4	4
Population.....	1,572	1,685	2,052	1,525
Total population of towns and farms.....	1,996	2,242	2,651	2,123
Number of public schools.....	6	6	6	6
Number of churches.....	5	5	5	5
Number of banks.....	2	2	1	1
Total capital stock.....	\$30,000	\$30,000	\$20,000	\$20,000
Amount of deposits.....	\$418,548	\$319,086	\$275,000	\$390,000
Number of depositors.....	1,060	824	800	1,000

## IDAHO, MINIDOKA PROJECT

The Minidoka project is located in Minidoka and Cassia Counties, Idaho; Jackson Lake Reservoir is in Lincoln County, Wyo. The Oregon Short Line is the only railroad on the project. Project towns and estimated population are: Burley, 4,000; Rupert, 2,500; Paul, 300; Declo, 150; Heyburn, 100; Acequia, 20. The source of water supply is Snake River, supplemented by storage. The irrigation season is from April 1 to October 15 (198 days); average rainfall for 19 years 12.2 inches; average of maximum and minimum temperatures for the past 19 years 99.1° and -13.2° F. The principal products are alfalfa, wheat, oats, barley, clover seed, sugar beets, and potatoes.

The project is watered by two canal systems, one on either side of Snake River. Power developed at the diversion dam is used in pumping water from the canals for irrigating high lands, and is also used for municipal and domestic purposes. Storage for the project is provided by a reservoir at Jackson Lake, Wyo., with a total capacity of 847,000 acre-feet, and by Lake Walcott, at the upper end of the project, with an available capacity of 100,000 acre-feet.

For many years the extension of the Minidoka project by pumping onto a tract of fine land north and west of the Gravity division has been contemplated. This requires large storage facilities to provide the necessary water supply. A large number of the canal systems already in service under private and district management also require stored water to protect their lands in years of drought. Investigation of the reservoir site at American Falls demonstrated that it is of sufficient capacity to care for the needs of the Government and other lands. A plan of cooperation provides that the operating companies will pay their share of the cost of constructing storage as the work progresses. Three irrigation districts have already made large payments; three other districts, one of them including five canal companies with 400,000 acres, have signed contracts. A contract has been signed with the Idaho Power Co. for the necessary portion of their conflicting rights at American Falls. Extensive improvements were completed in connection with the new town site of American Falls.

#### ACTIVITIES DURING FISCAL YEAR

*American Falls Reservoir.*—A contract was executed on July 2, 1923, by the Hillsdale irrigation district for 26,000 acre-feet of American Falls storage. This contract was approved on June 5, 1924. Another contract, dated July 3, 1923, was made with this company for the lease of 15,000 acre-feet of Jackson Lake storage water pending the completion of American Falls Reservoir. This contract was approved on June 30, 1924. The total storage subscriptions, including 520,000 acre-feet for the proposed Minidoka North Side pumping division, now amount to 1,066,000 acre-feet for 643,000 acres of land.

Contracts were entered into during the year amounting to \$266,553.60 for real estate for right-of-way purposes. Of this amount, \$171,142.17 was for city property and \$95,411.43 for rural property.

A contract was negotiated with the city of American Falls providing for the vacation of streets and alleys in the old town and for the construction of certain improvements in the new town at a cost of \$342,000. Under the terms of that contract a sewer system was completed, a water system was practically completed, streets were graded and a number of them graveled, and the work of building an extensive system of sidewalks was under way.

Lots in the new town were appraised and placed on the market and about 125 were disposed of.

Appraisals were made of all property in the town of American Falls that will be submerged, and of all rural property needed for right of way for a reservoir of 1,700,000 acre-feet capacity. An appraisal was also made of the salvage value of all buildings in American Falls that have been or will be acquired by the United States, and about 60 per cent of this salvaged property was sold.

Financial conditions showed improvement. Crop yields in 1923 were good and prices on most farm products fair. There was a marked increase in dairying, substantially stimulated by the operation of five cheese factories on the project. Two sugar factories paid out to project farmers \$1,100,000 for beets raised during the 1923 season. Despite a general water shortage, the 1924 crop prospect was good.

*Operation and settlement data, Minidoka project*

Item	1918	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	121,000	121,392	121,557	121,557	121,562	121,570
Acreage irrigated.....	105,082	104,259	107,650	107,230	105,580	104,470
Miles of canal operated.....	634.37	634.60	634.60	634.60	634.60	634.60
Water diverted (acre-feet).....	745,821	626,645	734,428	703,929	712,975	706,889
Water delivered to land (acre-feet).....	390,903	349,012	383,766	<sup>1</sup> 90,363	<sup>1</sup> 107,573	<sup>1</sup> 112,380
Per acre of land irrigated (acre-feet) <sup>2</sup> .....	3.7	3.8	3.6	<sup>1</sup> 2.13	<sup>1</sup> 2.38	<sup>1</sup> 2.39
Total number of farms on project.....	2,340	2,353	2,420	2,454	2,451	2,453
Population.....	8,490	9,029	9,250	8,848	8,301	7,571
Number of irrigated farms.....	2,208	2,353	2,420	2,454	2,451	2,382
Operated by owners or managers.....	1,556	1,877	1,863	1,987	1,868	1,758
Operated by tenants.....	652	476	557	467	583	624
Population.....	8,490	9,029	9,250	8,848	8,301	7,571
Number of towns.....	6	6	6	6	6	6
Population.....	6,900	8,500	9,000	8,445	8,170	7,070
Total population towns and farms.....	15,090	17,529	18,250	17,293	16,471	14,641
Number of public schools.....	21	28	26	22	22	22
Number of churches.....	25	25	29	29	29	29
Number of banks.....	8	8	10	<sup>3</sup> 6	<sup>3</sup> 5	<sup>3</sup> 4
Total capital stock.....	\$240,000	\$260,000	\$345,000	<sup>3</sup> \$190,000	<sup>3</sup> \$180,000	<sup>3</sup> \$210,000
Amount of deposits.....	\$2,543,343	\$3,725,691	\$3,860,744	<sup>3</sup> \$1,140,000	<sup>3</sup> \$1,100,000	<sup>3</sup> \$1,250,000
Numbers of depositors.....	10,663	11,086	12,725	5,900	5,000	6,000

<sup>1</sup> South Side pumping division; data from Gravity division not available.<sup>2</sup> Partially estimated.<sup>3</sup> Exclusive of banks that failed.**MONTANA, HUNTLEY PROJECT**

The Huntley project is located in the south central part of Montana, Yellowstone County, and is tributary to the Northern Pacific and the Chicago, Burlington & Quincy Railroads. There are five principal towns on the project—Huntley, Worden, Ballantine, Pompeys Pillar, and Nibbe—which provide excellent commercial facilities to all parts thereof. The project is virtually completed, and water may be delivered to all lands from the present system. The irrigation plan provides for the diversion of water from the Yellowstone River at a point 2 miles west of Huntley and for a gravity supply to all project lands except 5,400 acres under the high-line canal and its extensions, which are served by two pumping plants located  $1\frac{1}{4}$  miles east of Ballantine. These pumping plants elevate a maximum of 106 second-feet up a 45-foot lift into the high-line canal. The water supply for the project is ample and is derived direct from the Yellowstone River without diversion dam or storage works.

The soils consist of heavy clays and light sandy loams, lying at an average elevation of about 3,000 feet above sea level. Climatic conditions are favorable to the production of staple crops. The average annual rainfall is 12 to 13 inches.

**ACTIVITIES DURING FISCAL YEAR**

Agricultural conditions on June 30, 1924, were very good but not quite equal to those of 1923. The financial condition of the entrymen and landowners was greatly improved owing to the beet crop of 1923.

All supplemental construction funds were spent and the only work in progress was the routine operation and maintenance, which consisted principally in cleaning of ditches with the Ruth dredger, the upkeep of structures, replacement of deteriorated trap boxes, and repairs to tile drains.

No new commercial development has taken place on the project for several years.

*Operation and settlement data, Huntley project*

Item	1918	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to deliver water	31,360	31,265	32,085	31,964	32,000	32,000
Acres irrigated	19,262	19,310	20,020	18,800	19,523	18,780
Miles of canal operated	229	229	229	229	229	229
Water diverted (acre-feet)	47,982	92,638	79,079	79,186	72,245	72,803
Water delivered to land (acre-feet)	20,182	31,785	24,250	28,814	18,768	20,286
Per acre of land irrigated (acre-feet)	1.06	1.64	1.21	1.42	0.96	1.01
Total number of farms on project	691	691	691	691	690	1,596
Number of irrigated farms	561	549	608	578	590	547
Operated by owners or managers	359	315	320	377	387	289
Operated by tenants	202	234	283	201	203	278
Population	2,107	2,000	1,883	1,861	1,682	1,015
Number of towns	8	8	8	8	8	8
Population	599	599	664	673	673	530
Total population in towns and on farms	2,706	2,599	2,547	2,534	2,355	1,545
Number of public schools	8	8	8	8	8	8
Number of churches	6	6	6	7	7	9
Number of banks	4	4	4	4	2	2
Total capital stock	\$85,000	\$85,000	\$95,000	\$95,000	\$50,000	\$50,000
Amount of deposits	\$540,434	\$560,000	\$588,362	\$402,282	\$156,000	\$155,000
Number of depositors	1,400	1,400	1,711	1,475	810	800

<sup>1</sup> Differs from previous years because withdrawn public lands and unentered private lands are not included.

**MONTANA, MILK RIVER PROJECT**

The Milk River project is located on the Great Northern Railway in north-eastern Montana, about 50 miles south of the Canadian boundary, and extending from the mouth of the Milk River (which is about 120 miles west of the North Dakota line) westward for about 150 miles to and beyond Chinook. The average elevation is about 2,200 feet; the soil grades from loam through finer textured loam or clay to a soil known locally as gumbo. The average annual rainfall is about 13.24 inches; the ordinary maximum summer and minimum winter temperatures are about 100° and -40° F., respectively.

The irrigation plan provides for the storage of water in the Sherburne Lakes and its diversion through a canal 28.9 miles long, heading three-fourths of a mile below the lower St. Mary Lake and discharging into the North Fork of Milk River, thence flowing through Canada for 216 miles and returning to the United States for the irrigation of lands on the Milk River from above Chinook to and below Glasgow; the storage of water in Nelson Reservoir located about 20 miles northeast of Malta; a storage reservoir known as the Chain Lakes Reservoir, between Havre and the Canadian boundary; the diversion of water from the Milk River by three dams near Chinook and Harlem into canals on each side of the river comprising the Chinook division; the diversion of water from the Milk River by a dam near Dodson into two canals, the Dodson North Canal irrigating lands near Dodson and Malta, and the Dodson South Canal conveying water to Nelson Reservoir and irrigating lands near Wagner, Malta, Bowdoin, Saco, and Hinsdale, comprising the Malta division; and the diversion of water from the Milk River by a dam near Vandalia into a canal on the south side of the river for the irrigation of lands near Tampico, Glasgow, and Nashua, comprising the Glasgow division.

**ACTIVITIES DURING FISCAL YEAR**

The St. Mary Canal was operated from May 5 to September 1 0 1923, and opened May 1, 1924; canals on the Malta and Glasgow divisions were operated from about April 15 to about October 10, 1923. The maximum water stored in Sherburne Reservoir was 47,400 acre-feet, and in Nelson Reservoir 42,000. As a matter of precaution the high water level is being increased gradually in both these reservoirs until the maximum capacity will eventually be reached. Heavy rains in June, 1923, reduced the amount of irrigation water demanded and produced floods which materially damaged

growing crops and irrigation works. A successful demonstration of sugar-beet raising was made on about 100 acres on 23 farms. The Malta irrigation district, embracing 67,710 acres between Dodson Dam and Hinsdale, was created on December 28, 1923.

About 70 families, comprising about 350 people, settled on lands in the Chinook division, mostly under the Harlem and Paradise Canals; and 16 families, aggregating about 80 people, on the Malta division in the vicinity of Malta, Wagner, and Dodson. Most of these settlers came from Idaho, as a result of a settlement campaign by the Great Northern Railway. However, the railway company confined its activities mostly to the Chinook division, and will not push the campaign on the Malta and Glasgow divisions until such time as the proposed contracts with the Malta irrigation district and the proposed Glasgow irrigation district are executed. The lands on which these settlers located are in general partly improved, and the purchase price is from \$40 to \$50 per acre, payable in about 8 annual installments with about 7 per cent interest on deferred payments.

*Operation and settlement data, Milk River project*

Item	1919	1920	1921	1922	1923
Acres for which bureau is prepared to supply water:					
Malta and Glasgow divisions.....	58,900	66,600	1 66,373	66,500	1 64,800
Chinook division.....	20,440	25,300	27,727	30,000	32,500
Acres irrigated.....	25,485	24,330	1 42,400	1 46,370	1 41,900
Miles of canal operated, exclusive of Chinook division.....	317	361	276	284	282
Water diverted (acre-feet):					
For Malta and Glasgow divisions.....	86,700	80,800	54,444	75,177	67,200
For Chinook division.....	27,200	28,900	33,335	27,655	34,000
Water delivered to land, exclusive of Chinook division (acre-feet).....	21,500	10,460	6,190	6,068	6,875
Per acre of land irrigated exclusive of Chinook division (acre-feet).....	0.84	0.58	0.54	0.51	0.50
Total number of farms on project <sup>1</sup> .....	240	466	304	298	263
Population.....	1 757	1 867	1 816	1 1,057	1 1,839
Number of irrigated farms.....	247	230	178	209	211
Operated by owners or managers.....	186	208	134	130	146
Operated by tenants.....	61	22	44	79	65
Population.....	750	763	484	651	506
Number of towns.....	11	15	15	15	16
Population.....	6,500	1 7,796	1 7,170	1 7,100	1 7,675
Total population on farms and towns.....	7,257	1 8,663	1 7,986	1 8,157	1 9,514
Number of public schools.....	20	38	38	38	35
Number of churches.....	22	25	25	25	30
Number of banks.....	23	25	24	23	20
Total capital stock.....	1 \$780,000	1 \$765,000	1 \$825,000	1 \$843,000	1 \$709,500
Amount of deposits <sup>2</sup> .....	1 \$5,279,730	1 \$4,500,000	1 \$3,562,000	1 \$4,350,000	1 \$3,736,600
Number of depositors <sup>3</sup> .....	1 17,600	1 14,000	1 12,600	1 12,000	1 9,900

<sup>1</sup> Reduction due to better data on irrigable area.

<sup>2</sup> Includes irrigated area in the Chinook division and land in the Malta and Glasgow divisions irrigated wholly or in part from flood water systems; project proper, 19,270 acres.

<sup>3</sup> Total number of farms reported on crop census.

<sup>4</sup> Includes Chinook division.

<sup>5</sup> Deposits received from large area not in project.

## MONTANA, SUN RIVER PROJECT

The Sun River project is located in Cascade, Chouteau, Lewis and Clark, and Teton Counties, lying to the north and west of Great Falls, Mont. It is served by lines of the Great Northern and the Chicago, Milwaukee & St. Paul Railways. The sources of water supply are Sun River and its tributaries, Deep Creek, Bowl Creek, and Basin Creek. The average elevation of the irrigable area is about 3,700 feet above sea level; the soil is loam, clay, and alluvium. The average annual rainfall is 10.9 inches; the average annual tem-

peratures are: Maximum, 96° F.; minimum, -33° F.; mean, 44° F. The length of the irrigation season is from May 1 to October 10 (163 days); the principal crops are hay, grain, vegetables, livestock, and dairy products. The principal markets are Great Falls, St. Paul, Minneapolis, Chicago, and Seattle.

The Fort Shaw division is watered by a canal system taking water from the Sun River. For the irrigation of lands north of Sun River water is diverted from the North Fork of Sun River and is carried through Pishkun, Sun River Slope, and Greenfields canals to the head of the irrigable lands in Greenfields division. The distribution system has been built for the irrigation of 40,000 acres in Parts One and Two of the Greenfields division, and for 2,300 acres in Big Coulee division.

Plans for future development provide for storage works on the upper North Fork of Sun River, enlargement of Pishkun, Sun River Slope, and Greenfields canals, and construction and extension of lateral systems. Possible future development may include the enlargement of Willow Creek Reservoir and diversion of water from North Fork of Sun River thereto, the enlargement of Pishkun Reservoir and diversion of water from Deep Creek thereto, storage works on Muddy Creek and in Benton Lake, and canal systems for the Vaughn and Benton divisions.

### ACTIVITIES DURING FISCAL YEAR

*Lateral extensions.*—Work on the construction of structures, part 2, Greenfields division, was carried over from the previous year and the contractor finally completed the work October 9, 1923. This portion of the project comprises an area of 14,000 acres. The earthwork is completed, but the turnouts to unentered public land, covering an area of 2,000 acres, have not been built.

*Drainage.*—Work on part 1, Greenfields division, was continued with two electrically operated dragline excavators during the first half of the fiscal year. The completed drains have removed large quantities of water and thus far have kept the water down 6 feet or more below the ground surface for a distance of about one-half mile on either side of the drain. The situation at the end of the calendar year 1923 was such that it was the opinion that one dragline could do all the work necessary to protect the lands that were threatened with seepage and, in December, one of the draglines was transferred to the Boise project. Work was started early in April, 1924, and at the end of the fiscal year 11.2 miles of drains had been excavated, making a total for the project of 16.3 miles.

*Operation and maintenance.*—The season of 1923 opened favorably for the growth of crops. The first part of June was hot and dry, but, beginning with June 15, frequent rains made it unnecessary to use water from the canal system, particularly for the irrigation of grain. The precipitation for the calendar year was 15.81 inches and more than half of this fell in May, June, and July.

On the Fort Shaw division the first delivery of water was made May 20 and the season closed October 19.

On the Greenfields division water was first delivered to the irrigable lands on June 23. Repairs to the main canal made it impossible to operate the canal prior to this time. As a result of a wet season, the use of water was limited to an area of 2,624 acres, most of which was in alfalfa.

The season of 1924 opened with a heavy demand for water as there was very little rain in May. Some of the farmers were obliged to irrigate before seed would germinate, which is very unusual for the Sun River project. The demand dropped somewhat in June, but a large quantity of water was used in July.

*Operation and settlement data, Fort Shaw and Greenfields divisions, Sun River project*

Item	1918	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	14,978	40,057	40,057	40,057	42,465	42,470
Acreage irrigated.....	7,569	11,496	14,780	21,750	20,537	9,090
Miles of canal operated.....	96	244	250	267	267	267
Water diverted (acre-feet).....	30,067	42,863	75,595	88,258	64,683	44,709
Water delivered to land (acre-feet).....	11,193	24,060	21,653	30,300	24,200	13,208
Per acre of land irrigated (acre-feet).....	1.48	1.9	1.47	1.29	1.17	1.31
Total number of farms on project.....	239	212	500	500	500	500
Population.....	508	542	1,000	1,000	1,000	1,000
Number of irrigated farms.....	187	199	354	373	388	294
Operated by owners or managers.....	118	151	294	285	273	200
Operated by tenants.....	69	48	90	88	115	94
Population.....	508	542	861	949	978	817
Number of towns.....	8	8	8	4	4	4
Population.....	158	155	685	378	401	354
Total population in towns and on farms.....	666	697	1,685	1,378	1,401	1,354
Number of public schools.....	4	4	17	17	17	17
Number of churches.....	4	4	11	11	11	11
Number of banks.....	1	1	15	13	13	13
Total capital stock.....	\$20,000	\$20,000	\$110,000	\$65,000	\$71,500	\$65,000
Amount of deposits.....	\$98,000	\$110,000	\$391,121	\$150,000	\$158,000	\$212,000
Number of depositors.....	390	400	1,278	780	740	650

<sup>1</sup> Applies to whole project rather than to the two divisions named.

**MONTANA-NORTH DAKOTA, LOWER YELLOWSTONE PROJECT**

The Lower Yellowstone project is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. The source of water supply is the Yellowstone River, diversion from which into the main canal is at a point 18 miles below Glendive. Irrigation works have been constructed to deliver water to about 58,000 acres. Water is available for the entire irrigable area. The length of the irrigation season depends upon the amount of precipitation in the spring. May 1 to October 10 (163 days), is the maximum period of water deliveries. The average elevation is 1,900 feet above sea level. The average number of days between the last killing frost in the spring and the first in the fall is 129. Since 1905 the average annual rainfall has been about 14.4 inches. The average of the highest temperature is 103° F., and the average of the lowest -35° F. Some alkali and gumbo are found in scattering low tracts, but the project as a whole has a deep sandy loam soil. As the irrigable area of the project is a long and narrow tract with cross drainage creeks at intervals of 3 to 6 miles, drainage construction will not be expensive. The duty of water is about 1.5 acre-feet per acre. The principal crops are alfalfa, grain, sugar beets, potatoes, and corn. Billings, Mont., is the market for sugar beets; Duluth and Minneapolis, Minn., for grain; Chicago and the South for potatoes. Forage crops are consumed locally.

**ACTIVITIES DURING FISCAL YEAR**

Construction work consisted of minor lateral extensions, both earth-work and structures, and some additional concrete checks in the main canal. The total expenditure for construction was about \$12,000. The construction work required to deliver water to all project land was virtually completed.

Good progress was made on the removal of silt from the main canal, where it is estimated that about 250,000 cubic yards have accumulated in the first 10 miles. The canal has been in operation since 1909, and during much of this time small quantities of water have been used, which resulted in low velocities and greatly increased silt deposits. During the year about 115,000 cubic yards of silt were removed with drag lines, at a cost of 15 cents per cubic yard. One Ruth ditch cleaner was operated continuously during the summer months on laterals, and is keeping the system in satisfactory condition. About 30,000 cubic yards have been removed, at a cost of 9 cents per cubic yard.



Extensive repairs were made to the Lower Yellowstone Dam by the addition of 2,000 cubic yards of heavy rock riprap in the river bed just below the dam. Canal banks and structures were repaired and worn-out wooden structures replaced, mainly with concrete, as required to keep the system in good condition.

*Operation and settlement data, Lower Yellowstone project*

Item	1919 <sup>1</sup>	1920 <sup>2</sup>	1921 <sup>3</sup>	1922 <sup>4</sup>	1923
Acreage for which bureau was prepared to supply water.....	42,167	40,200	40,344	40,200	53,000
Acreage irrigated.....	21,300	19,120	19,980	15,599	17,859
Miles of canal operated.....	188	187	174	213	285
Water diverted (acre-feet).....	70,029	47,375	64,972	49,280	99,280
Water delivered to land (acre-feet).....	26,252	16,633	25,733	18,411	22,459
Per acre of land irrigated (acre-feet).....	1.23	0.87	1.28	1.17	1.26
Total number of farms on project.....	514	543	572	575	686
Population.....	1,284	1,368	1,390	1,591	1,265
Number of irrigated farms.....	405	375	370	370	373
Irrigated farms operated by owners and managers.....	266	265	223	236	231
Irrigated farms operated by tenants.....	119	110	147	134	142
Number of towns.....	8	8	8	8	8
Population.....	3,900	2,850	2,805	2,805	2,415
Total population in towns and on farms.....	5,184	4,218	4,195	4,396	3,680
Number of public schools.....	12	12	12	13	13
Number of churches.....	13	15	15	15	15
Number of banks.....	10	10	9	7	4
Total capital stock.....	\$330,000	\$330,000	\$335,000	\$200,000	\$100,000
Amount of deposits.....	\$2,365,000	\$2,331,000	\$1,851,000	\$1,425,000	\$208,045
Number of depositors.....	7,600	6,500	4,726	4,475	1,859

<sup>1</sup> Project on rental basis.

<sup>2</sup> Project operated under contracts with irrigation districts.

<sup>3</sup> District lands only.

<sup>4</sup> Part of decrease due to exact census.

<sup>5</sup> Decrease in number of schools due to consolidation.

## NEBRASKA-WYOMING, NORTH PLATTE PROJECT

The North Platte project is situated in western Nebraska and eastern Wyoming. The source of water supply is the North Platte River. The irrigation plan provides for storage of flood waters of the river in Pathfinder Reservoir, located about 50 miles southwest of Casper, Wyo., and in smaller reservoirs along the canal lines; and diversion from the North Platte River by a dam near Whalen, Wyo., into the Interstate Canal, supplying water for lands on the north side of the river, and into the Fort Laramie Canal watering lands on the south side. A dam to be constructed near Guernsey, Wyo., will provide additional storage from a regulating reservoir and develop power. The Northport division on the north side in the vicinity of Northport, Nebr., is watered from an extension of the Tri-State Canal.

Three irrigation districts have been formed. The Northport irrigation district includes all of the Northport division. The Gering and Fort Laramie irrigation district covers all of the Fort Laramie division in Nebraska and the Goshen irrigation district covers all of the Fort Laramie division in Wyoming. The limit of area of farm units on all divisions is 80 acres for public and 160 acres for private land.

The railroads serving the project cities and towns, which have an estimated population of 18,900, are the Chicago, Burlington & Quincy, and Union Pacific. The character of the soil varies from sandy loam on the major portion of the Interstate and Northport divisions to gumbo soil on portions of the Fort Laramie division. The principal products are alfalfa, cereals, corn, sugar beets, and potatoes; and the principal markets are Omaha, Nebr., Kansas City and St. Joseph, Mo., Denver, Colo., and central Wyoming. The length of the irrigating season is from April 1 to September 30, and the average rainfall amounts to 14.82 inches. The average temperature ranges between 99° maximum and -21° F. minimum.

## ACTIVITIES DURING FISCAL YEAR

*Storage.*—On account of the unusually heavy rainfall on the project, the requirement for storage water from the Pathfinder Reservoir was unusually small, and at the end of the irrigation season the storage was 647,100 acre-feet. The maximum inflow, 15,920 second-feet, occurred on April 17, 1924, which is the earliest date on record for maximum inflow.

*Interstate division.*—Work was continued on the enlargement and strengthening of the Interstate Canal and the replacement of structures in the third lateral district under supplemental construction. The total yardage moved in the enlargement of the canal was 795,073 cubic yards. At the end of the fiscal year, all the replacement work to be done under supplemental construction was completed or under contract.

Several drainage channels were enlarged and extended, virtually completing such of that work as appears practicable.

The total precipitation for the year was 21.71 inches as compared with an average annual precipitation of 14.82 inches. For this reason, the demand for irrigation water was less than any year for several years, and it was necessary to deliver water on the rotation basis for only 10 days for lands under the Interstate Canal, six days for lands under the High Line Canal, and no rotation was necessary under the Low Line Canal.

*Fort Laramie division.*—The excavation of the Fort Laramie Canal was completed on November 27, 1923. The canal is 130 miles long and required the excavation of 11,362,617 cubic yards of material. Of this amount, 7,621,570 cubic yards were excavated by contract at a field cost of 17 cents per cubic yard and 3,741,047 cubic yards were excavated by Government forces at a total field cost of  $9\frac{2}{3}$  cents per cubic yard. The principal canal structures completed during the year were the Kiowa Creek, Owl Creek, and Stiver Canyon Siphons, and the Browns Canyon crossing. Good progress was made by the contractor in the construction of Tunnel No. 3 on the Fort Laramie Canal. The excavation was completed on April 8, 1924. In addition to the operation of six draglines, construction of structures on the canal and lateral systems was carried on from two large Government construction camps. Practically all earthwork and the hauling of all gravel and other materials used in construction were contracted. A large percentage of the work on concrete structures on the lateral system was also done by contract. At the end of the fiscal year, all the earthwork excavation, virtually all of the hauling, and a large percentage of the concrete work necessary for the completion of the division were either completed or under contract. Construction work necessary for an additional 18,000 acres of land had been completed at the beginning of the irrigation season of 1924, and at the end of the fiscal year the work was virtually completed for an additional 7,000 acres.

The construction of the Gering Drain under a cooperative contract with the Gering irrigation district was completed and the drain was extended to provide an outlet for waste and seepage waters from the portion of the Fort Laramie division in the Gering Valley. One electric dragline was operated continuously on the construction of the Kiowa and Dry Creek Drains in the vicinity of Lyman, Nebr., and an additional electric dragline was moved to that work upon the

completion of the canal excavation. One P. & H. No. 208 dragline was employed continuously on the excavation of drainage ditches in Wyoming.

During the season of 1923, the Fort Laramie Canal was operated to Horse Creek at mile 67.5. At the beginning of the season of 1924, water was delivered through an additional 40 miles of the same canal to the Stiver Canyon Siphon and to approximately 18,000 acres of land in addition to that irrigated during the season of 1923. The canal was operated for the first 25 miles to furnish water for the Lingle power plant.

*Northport division.*—No construction work was in progress on this division. Water was available for all of the land on the division and only routine operation and maintenance work was necessary.

*Operation and settlement data, Interstate division, North Platte project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water	<sup>1</sup> 129,715	<sup>1</sup> 129,629	<sup>1</sup> 129,686	113,436	113,490
Acreage irrigated	<sup>1</sup> 99,418	<sup>1</sup> 97,640	<sup>1</sup> 97,400	87,300	87,404
Miles of canal operated	806	807	809	805	802
Water delivered to land (acre-feet)	<sup>1</sup> 201,505	<sup>1</sup> 175,153	<sup>1</sup> 186,328	222,509	155,600
Per acre of land irrigated (acre-feet)	<sup>1</sup> 2.27	<sup>1</sup> 1.90	<sup>1</sup> 2.14	2.55	1.78
Total number of farms on project <sup>1</sup>	1,420	1,410	1,450	1,458	1,458
Population	4,500	5,000	5,700	5,300	5,300
Number of irrigated farms	1,310	1,300	1,240	1,340	1,307
Operated by owners or managers	860	800	710	720	660
Operated by tenants	450	500	630	620	638
Population	4,066	4,746	5,200	4,782	4,543
Number of towns	8	9	9	9	6
Population	11,610	14,382	14,400	14,400	12,700
Total population of towns and farms	16,110	19,382	20,100	19,700	18,000
Number of public schools	40	40	40	40	50
Number of churches	25	26	26	26	37
Number of banks	21	21	27	12	13
Total capital stock	\$462,000	\$777,500	\$787,500	\$475,000	\$505,000
Amount of deposits	\$3,100,000	\$7,371,100	\$6,834,400	\$3,957,700	\$4,533,000
Number of depositors	7,500	12,000	11,200	11,650	13,300

<sup>1</sup> All data exclusive of North Platte Canal & Colonization Co. lands.

<sup>1</sup> Includes North Platte Canal & Colonization Co. lands.

<sup>1</sup> Exclusive of lands under North Platte Canal & Colonization Co. tract.

<sup>1</sup> Statistics for items below, for years previous to 1922, include some figures for Fort Laramie and Northport divisions.

*Operation and settlement data, Fort Laramie division, North Platte project*

Item	1921	1922	1923
Acreage for which bureau was prepared to supply water	16,232	44,091	55,500
Acreage irrigated	12,150	20,392	32,441
Miles of canal operated	138	311	402
Water delivered to the land (acre-feet)	22,065	43,689	45,808
Per acre of land irrigated (acre-feet)	1.85	2.15	1.41
Total number of farms on project <sup>1</sup>	407	573	717
Population	1,500	1,086	1,700
Number of irrigated farms	190	320	564
Operated by owners or managers	105	244	269
Operated by tenants	85	76	305
Population	433	650	1,411
Number of towns	3	11	10
Population	2,900	5,000	4,800
Total population of towns and farms	4,400	6,086	6,500
Number of public schools	10	20	38
Number of churches	1	16	18
Number of banks	1	12	7
Total capital stock	<sup>1</sup> \$185,000	\$285,000	\$165,000
Amount of deposits	<sup>1</sup> \$1,039,600	\$1,794,800	\$1,413,000
Number of depositors	5,500	3,600	4,150

<sup>1</sup> Data for items below for years previous to 1923 estimated.

<sup>1</sup> Lands on the Interstate and Fort Laramie divisions are tributary to 6 of the banks listed above.

<sup>1</sup> \$155,000 of this amount is listed under similar caption on Interstate division.

<sup>1</sup> \$919,600 of this amount is listed under similar caption on Interstate division.

*Operation and settlement data, Northport division, North Platte project*

Item	1922	1923
Acreage for which bureau was prepared to supply water.....	4,712	16,260
Acreage irrigated.....	3,645	8,955
Miles of canal operated.....		100
Water delivered to the land (acre-feet).....	11,722	16,821
Per acre of land irrigated (acre-feet).....	3.02	1.88
Total number of farms on project.....	232	238
Population.....	800	499
Number of irrigated farms.....	50	148
Operated by owners or managers.....	19	70
Operated by tenants.....	31	78
Population.....	260	226
Number of towns.....	2	2
Population.....	1,400	1,400
Total population of towns and farms.....	2,220	1,806
Number of public schools.....	7	6
Number of churches.....	6	6
Number of banks.....	2	2
Total capital stock.....	\$50,000	\$50,000
Amount of deposits.....	\$827,000	\$943,600
Number of depositors.....	2,000	2,480

**NEVADA, NEWLANDS PROJECT.**

The Newlands project is located on the Southern Pacific Railroad in Churchill, Storey, Lyon, and Washoe Counties, Nev. The water supply is from the Truckee and Carson Rivers. The average annual precipitation on the irrigable area, which is at an elevation of about 4,000 feet above sea level, is 4.94 inches. The principal crops are alfalfa, grain, potatoes, melons, and dairy products. Farm units range in size from 40 to 160 acres.

**ACTIVITIES DURING FISCAL YEAR**

The distribution system was extended 2.75 miles by the reconstruction of a portion of the "D" Lateral and construction of the Payne, Harden, and Shane Laterals, all in the Carson division. This work involved 6,110 cubic yards of excavation. Work was continued on the installation of the new 78-inch steel power penstock, 1,128 feet in length from Lahontan Reservoir to the power plant, which was commenced during March, 1923, in accordance with the contract executed March 3, 1923, with the Canyon Power Co. On April 23, 1924, the Lahontan power plant was placed under operation from the new penstock. Reconstruction of about one-half of the Lahontan Dam spillway pool wall and the lower floor of the left spillway was necessary. Considerable back filling, replacing rock paving, and installing the 60-inch balanced needle valve and valve-house remained to be done at the end of the year.

In connection with the proposed Spanish Springs Reservoir near Reno, Nev., for the storage of Truckee River water, an appraisal board made a report on August 17, 1923, covering right of way necessary for the feeder and outlet canals, following the completion of their report on the reservoir site dated April 30, 1923. Estimates of cost, areas to be irrigated, water supply, etc., for this new reservoir were prepared in the Denver and Fallon offices. Construction of deep open drains under the contract dated January 22, 1921, with the Truckee-Carson irrigation district was virtually completed during December, 1923, and was finished before the end of the fiscal year. Final report covering this work which was commenced during August, 1921, was made under date of February 10, 1924.

This contract work involved the excavation of 150.33 miles of drains with the moving of 5,472,751 cubic yards of material and the placing of 1,034 timber structures. A report, dated February 14, 1924, was made on additional work necessary to protect lands under water-right contracts. Cleaning and deepening of about 8.8 miles of old drains were done as operation and maintenance.

*Operation and maintenance.*—The Lahontan power plant was operated under lease by the Canyon Power Co. without a shutdown. Water deliveries for the 1924 irrigation season commenced during the last week of March. Precipitation on the watershed during the winter was about 25 per cent of normal and the lowest on record. The water supply was ample during the season of 1923 in both the Truckee and Carson Rivers, but the supply for irrigation under the Truckee Canal dropped below the requirements about May 20, 1924, and with practically no flood run-off in these rivers during the spring of 1924, it was necessary to adopt strict economy measures to distribute equitably the available supply. In order to relieve the water shortage in the Truckee division the installation of a pumping plant to pump water from Lahontan Reservoir into the Truckee Canal was commenced on April 23, 1924, and was put in operation on June 23. This plant consists of two 20-inch motor-driven centrifugal pumps to operate under a maximum head of 65 feet. During June, 1924, representatives of the bureau and the Governor of Nevada were negotiating with the owners of riparian property at Lake Tahoe in an effort to secure additional water from the lake by pumping.

*Operation and settlement data, Newlands project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	65,809	69,310	72,166	73,747	73,730
Acreage irrigated.....	44,324	45,610	46,160	44,963	44,890
Miles of canal operated.....	365	389	393	410	411
Water diverted (acre-feet).....	317,424	295,225	314,241	499,508	367,929
Water delivered to land (acre-feet).....	134,015	129,814	132,788	141,972	145,653
Per acre of land irrigated (acre-feet).....	3.02	2.85	2.87	3.15	3.24
Total number of farms on project.....	675	785	870	906	1,012
Population.....	2,396	2,523	2,652	2,450	12,737
Number of irrigated farms.....	694	742	788	778	1,788
Operated by owners or managers.....	619	677	708	681	1,681
Operated by tenants.....	75	65	80	97	1,107
Population.....	2,396	2,523	2,652	2,450	12,737
Number of towns.....	5	5	5	5	15
Population.....	2,240	2,830	2,560	2,500	12,500
Total population, towns, and on farms.....	4,626	5,353	5,152	4,950	5,297
Number of public schools.....	11	12	11	11	11
Number of churches.....	7	8	8	8	8
Number of banks.....	2	2	1	1	1
Capital stock.....	\$150,000	\$115,000	\$75,000	\$75,000	\$75,000
Amount of deposits.....	\$790,000	\$864,360	\$677,104	\$680,700	\$800,000
Number of depositors.....	1,860	2,500	2,000	1,700	1,800

<sup>1</sup> Data as of Dec. 31, 1923.

## NEW MEXICO, CARLSBAD PROJECT

The Carlsbad project is located in Eddy County, N. Mex., on the Santa Fe Railway system. Project cities and towns are Carlsbad, population 3,000; and Otis, Loving, and Malaga, with a combined population of 440. The source of water supply is Pecos River. The length of the irrigation season is 260 days, which includes two weeks in winter. The average elevation of the irrigable area

is 3,100 feet. The rainfall averages 14.2 inches. The average of recorded temperatures for a period of 23 years ranges from 112° to -7° F. The soil of the irrigable area is Pecos clay and sandy loam, with high lime content. The principal products are cotton, alfalfa, and miscellaneous grains and fruits. The principal markets are Carlsbad, Kansas City, Chicago, New Orleans, and Galveston. The irrigation plan provides for the storage of water in Lake McMillan and in Avalon Reservoir, both controlled by earth and rock-fill dams. Water is diverted at Avalon Reservoir into a canal system, which extends 25 miles in a southerly direction.

### ACTIVITIES DURING FISCAL YEAR

The storage reservoir did not fill during the winter of 1923-24, and storage became exhausted from July 7 to 11 and from July 20 to August 20. During these periods of no storage the flow of the river was very low. Only minor damage was done to the cotton crop as a whole, but there were a few cases of major individual damage. The yield of the third crop of alfalfa was decreased materially, which was in a measure compensated for by a heavy alfalfa seed yield. Farming operations were generally profitable, prices of both cotton and alfalfa being exceptionally good. The spring of 1924 was late and unfavorable, but crops were in good condition at the close of the fiscal year. The storage reservoir filled during the winter and a good early summer run-off from melting snows left considerable surplus water at the close of June.

A few families, principally from Arkansas, purchased farms averaging about 80 acres each. The necessity for reducing large holdings on the project is still urgent and there seems to be a general desire on the part of owners of excess land to reduce the size of farms; prices appear to be fair in most cases. The percentage of tenantry is higher than for previous years, but closer supervision of farm property rented by tenants to tenants is apparent in better-kept farms.

### Operation and settlement data, Carlsbad project

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water .....	25,000	25,000	25,000	25,000	25,000
Acreage irrigated .....	20,363	22,170	23,810	24,076	24,060
Miles of canal operated .....	45	45	45	45	45
Water diverted (acre-feet) .....	114,060	131,673	137,500	116,700	120,200
Water delivered to land (acre-feet) .....	48,983	53,644	50,371	56,687	57,256
Per acre of land irrigated (acre-feet) .....	2.4	2.42	2.49	2.86	2.38
Total number of farms on project .....	1,741	1,770	1,769	1,796	1,908
Population .....	1,378	1,575	1,435	1,580	2,128
Number of irrigated farms .....	565	368	426	333	388
Operated by owners or managers .....	2,298	1,189	1,277	1,194	188
Operated by tenants .....	267	267	149	149	200
Population .....	1,378	1,575	1,435	1,580	2,128
Number of towns .....	4	4	4	4	4
Population .....	3,378	3,375	3,375	3,440	3,440
Total population in towns and on farms .....	4,753	4,950	4,810	5,020	5,568
Number of public schools .....	7	13	13	10	12
Number of churches .....	8	11	11	12	12
Number of banks .....	3	5	3	3	1
Total capital stock .....	\$275,000	\$275,000	\$225,000	\$225,000	\$25,000
Amount of deposits .....	\$1,271,646	\$1,049,924	\$1,176,441	\$1,106,300	\$100,000
Number of depositors .....	2,611	2,617	2,350	2,374	4,300

<sup>1</sup> Water-right applications; 388 farms irrigated and cropped, 1923.

<sup>2</sup> Many farms were operated by one man.

<sup>3</sup> Several tenants on one farm, also operated in part by owner.

<sup>4</sup> Two bank failures January 2 and May 10, 1924.

## NEW MEXICO-TEXAS, RIO GRANDE PROJECT

The Rio Grande project is international and interstate, including approximately 83,000 acres of land in the Elephant Butte irrigation district of New Mexico, 67,000 acres in the El Paso County water improvement district No. 1 of Texas, and approximately 25,000 acres in the Republic of Mexico. The population of the principal city, El Paso, Tex., and suburbs is 95,000, and the project lands and towns have an additional population of 26,000.

Flood waters of the Rio Grande are stored in the Elephant Butte Reservoir. With an average rainfall of 10 inches, the use of water for irrigation in addition is approximately 3 acre-feet per acre. The irrigation season normally is from February 1 to October 15. Virtually all the lands are in private ownership. All lands in the United States are in irrigation districts, and contracts for repayment of construction charges and yearly operation and maintenance cost have been executed between these districts and the United States.

The project is divided into four divisions, namely, the Rincon, Leasburg, Mesilla, and El Paso. Each is furnished a water supply by diversion from the Rio Grande. The last-named division utilizes an international diversion dam located near El Paso, and this structure, maintained jointly by the irrigators of both countries, also diverts the water into the main canal for the Mexican lands.

Construction of the storage feature is virtually completed. On June 30, 1924, it was estimated that the distribution system, consisting of the construction of main diversions and reconstruction and extension of the old community ditches as the lateral system, was 86 per cent complete. The drainage system, when completed, will consist of 350 miles of deep, open drain, involving the excavation of 17,000,000 cubic yards, of which on June 30, 1924, 326 miles had been constructed.

Power development at Elephant Butte Dam consists of a small plant required for the operation of the water system and furnishing of lights. At the time of the construction of the dam six power gates and penstocks were incorporated in the structure, and it is estimated that a power plant with an output of 18,000 kilowatts could be constructed at some future date.

### ACTIVITIES DURING FISCAL YEAR

With the completion of the Tornillo intake from the Rio Grande near Fabens, which is the last diversion point for the project, main diversion features have been completed, and construction activities continued throughout the year about equally divided between distribution and drainage systems.

Work in the Rincon division to provide additional drains and canals progressed with the employment of additional excavator equipment released from lower valley work.

The successful crop yield created a new impetus to land cultivation and settlement, and during the winter of 1923 and 1924 a large number of new settlers came to the project and increased the demands for further canal and drainage construction. The increase in area over previous years to be farmed is approximately 15,000 acres, and fortunately funds and equipment were available to provide the necessary drainage and irrigation facilities to these new areas.

*Drainage.*—The results obtained in lowering the underground water and leaching alkali deposits are very successful and gratifying; 130,000 acres are now protected by constructed drains and the system has been built within the estimated cost.

*Operation and settlement data, Rio Grande project*

Item	1918	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water...	92,300	107,000	169,000	109,000	116,000	124,000
Acreage irrigated.....	64,781	170,000	173,846	185,580	189,589	192,220
Miles canal and drain operated.....	153	385	546	586	645	808
Water diverted (acre-feet).....	1613,638	1603,711	1677,953	1782,366	1998,728	1,036,419
Water delivered to land (acre-feet).....	1348,295	1174,945	1226,464	1197,086	204,452	188,819
Per acre of land irrigated (acre-feet).....	15.37	2.50	2.95	2.55	2.28	2.18
Total number of farms on project.....	2,287	2,703	3,021	3,204	3,584	3,743
Population.....	10,259	12,890	12,199	11,774	11,267	15,92
Number of irrigated farms.....	2,287	2,703	3,021	3,222	3,584	3,74
Operated by owners or managers.....	1,377	1,966	2,668	2,628	2,954	3,014
Operated by tenants.....	910	737	353	594	580	1,729
Number of towns.....	27	27	29	29	24	42
Population.....	87,997	89,816	100,235	101,235	110,442	111,883
Total population in towns and on farms.....	98,256	102,206	112,434	113,009	121,709	127,808
Number of public schools.....	52	54	102	108	49	73
Number of churches.....	82	83	105	106	110	115
Number of banks.....	18	17	14	13	13	9
Total amount of capital stock.....	\$3,000,000	\$3,250,000	\$2,990,000	\$2,960,000	\$2,950,000	\$2,675,000
Amount of deposits.....	\$32,000,000	\$33,000,000	\$30,898,499	\$28,194,815	\$30,000,000	\$27,323,442
Number of depositors.....	40,000	44,000	31,716	30,000	31,000	30,000

<sup>1</sup> Land irrigated by bureau distribution system only.

<sup>2</sup> Includes 1,120 acres Fort Hancock.

<sup>3</sup> Includes 5,369 acres in Falmas and Fort Hancock, outside project limits, irrigated under surplus stored water contract.

<sup>4</sup> Project proper.

<sup>5</sup> Measured at point of delivery from canals.

<sup>6</sup> Total diversions, including water wasted and rediverted from river below.

<sup>7</sup> Includes delivery to farms by Bureau of Reclamation operation and to heads of community ditches on project.

<sup>8</sup> Delivered to heads community ditches.

<sup>9</sup> 5,000 soldiers included in El Paso's population.

**NORTH DAKOTA, WILLISTON PROJECT**

The Williston project is located in Williams County, N. Dak., on the Great Northern Railway. Williston is the principal town and the project headquarters. The Missouri River is the source of water supply. The irrigation season is 80 days but may be lengthened by the action of the board of directors of the irrigation district; the average rainfall is 13 inches; the average high temperature is 99° and the average low -37° F. The principal products are sugar beets, alfalfa, corn, potatoes, dairy cows, and hogs. Public farm units are limited to 80 acres and private to 160 acres.

A central steam power plant is located near Williston adjoining Government-owned coal lands, where electrical energy is generated for the operation of the pumping stations, of which there are four. The plan of the Williston project provides for a series of motor-driven centrifugal pumps in an intake station on the Missouri River, a settling basin receiving the water from the intake station, and a main canal of 90 second-foot capacity extending along Little Muddy Creek to the power plant, where two sets of steam-driven turbines operate centrifugal pumps for the higher lifts. From the main canal, about midway between the river and the power plant, electrically driven pumps raise water 28 feet for the lands on the west side of Little Muddy Creek.

**ACTIVITIES DURING FISCAL YEAR**

A permanent land pumping station was constructed at an estimated cost of \$30,000. This station replaced the pumping barge, which was unsafe for further use after 16 years' service. The new station will save approximately \$1,200 per year in cost of launching and docking the barge and removal and placement of ways, and, with the installation of a smaller third pumping unit, is estimated to save an additional \$1,500 in consumption of electrical energy.

Operations were continued under the commercial power contract with the city of Williston. Notwithstanding a general depression in



business, the installation of additional small motors and appliances in the city made the requirements virtually the same as those of the fiscal year 1923.

The project operates its own coal mine and produces fuel from adjoining public lands to supply the power plant; 13,400 tons of coal were mined at a cost of \$1.94 per ton. This cost is 45 cents lower than the previous year. A recent investigation showed the costs to be about 40 cents per ton lower than the average for the mines of North Dakota and the conditions of the mine among the best. The irrigation district has urged that permission be granted to sell coal to farmers for the purpose of increasing the production and correspondingly reducing the unit cost.

Several farm homes were built on small tracts and every farm with improvements suitable for living quarters was occupied. Seventy-five additional persons were on the project for sugar-beet work, and a number of small houses were provided for them.

*Operation and settlement data, Williston project*

Item	1919	1920	1921	1922	1923
Area for which bureau was prepared to supply water.....	8,189	7,653	7,653	7,653	7,650
Acreage irrigated.....	2,446	2,810	2,090	1,383	1,170
Miles of canal operated.....	31	31	35	35	35
Water diverted (acre-feet).....	4,028	4,000	2,383	1,942	1,428
Water delivered to land (acre-feet).....	2,633	2,684	1,624	1,352	987
Water per acre of land irrigated (acre-feet).....	1.08	0.97	0.78	0.85	0.76
Total number of farms on project.....	105	105	105	105	144
Population.....	200	200	210	220	241
Number of irrigated farms.....	94	94	76	73	68
Operated by owners or managers.....	33	47	39	40	35
Operated by tenants.....	24	19	12	9	13
Operated by nonresidents.....	28	28	25	24	15
Population.....	181	194	200	212	224
Number of towns.....	2	2	2	2	2
Population.....	5,400	5,000	5,000	4,500	4,500
Total population of towns and farms.....	5,600	5,200	5,210	4,720	4,741
Number of public schools.....	6	6	6	6	6
Number of churches.....	6	6	7	7	7
Number of banks.....	4	3	3	2	1
Total capital stock.....	\$260,000	\$260,000	\$260,000	\$185,000	\$100,000
Amount of deposits.....	\$1,756,000	\$2,000,000	\$1,800,000	\$1,700,000	\$1,500,000
Number of depositors.....	3,600	5,010	3,600	3,500	3,000

<sup>1</sup> Does not include hired help or beet workers.

## OREGON, UMATILLA PROJECT

The Umatilla project is located in Umatilla and Morrow Counties and is traversed by the main line of the Oregon-Washington Railroad & Navigation Co. and the Columbia River Highway. The project towns are Hermiston, Umatilla, Irrigon, Boardman, and Stanfield.

The source of water supply is the Umatilla River, which has a drainage area covering 2,160 square miles. The mean annual run-off is 520,000 acre-feet.

The average elevation of the irrigable area is 470 feet above sea level, the average rainfall is 8.62 inches for 15 years and the length of the irrigation season will approximate 210 days. The principal products are alfalfa, fruits, vegetables, honey, and dairy products.

The irrigation plan of the East division provides for the diversion of water from the Umatilla River above Echo, Oreg., through a feed canal 24.5 miles in length to the Cold Springs Reservoir which has a storage capacity of 50,000 acre-feet, whence it is delivered directly to the land through a system of canals and laterals. Water is also diverted from the Umatilla River near the mouth of Butter Creek by the Maxwell Canal and when available supplements the discharge from the reservoir.

For the West division water is diverted from the Umatilla River about half way between Hermiston and Umatilla and is delivered directly to lands bordering the Columbia River in the vicinity of Umatilla, Irrigon, and Boardman.

The McKay Reservoir is under construction on McKay Creek about 6 miles south of Pendleton, Oreg. When completed this reservoir will have a storage

capacity of 75,000 acre-feet and form a supplemental water supply for 30,000 acres of land in the Stanfield and Westland irrigation districts in the South division of the project.

### ACTIVITIES DURING THE FISCAL YEAR

*East division.*—The principal construction work in progress was the continuation of the improvement of the A Canal.

In connection with betterments to the irrigation system as provided in the contract with the Hermiston irrigation district, the R Canal was lined and portions relocated.

Work was also commenced on the drainage betterments as provided for in the contract with the Hermiston irrigation district, and resulted in the excavation of 29,070 cubic yards of class 1, wet; 33,510 cubic yards of class 1, dry; 580 cubic yards of class 3, wet; 51 cubic yards class 3, dry; and 160 cubic yards of class 3, tunnel materials; and the construction of 14 minor concrete structures and 4 minor timber structures.

The construction of lateral extensions was continued, about 3.6 miles of lateral being built; 4,665 linear feet of 20-inch, 8,101 linear feet of 16-inch, and 2,862 linear feet of 12-inch concrete pipe were laid; and 2,952 linear feet of laterals were lined.

*West division.*—Number Four spillway, a wooden structure, was replaced by a concrete structure; 2,990 linear feet of 18-inch pipe were laid.

*South division.*—On June 30 the right-of-way for McKay Reservoir had all been purchased, the diversion and outlet tunnel excavated and lined, the preparation of the foundation under the dam well advanced, and excavation of rock from the spillway channel about one-half completed.

Placing of gravel in the dam embankment was proceeding at the rate of about 90,000 cubic yards per month; 263,000 cubic yards, or about 12 per cent of the required embankment, had been placed to the end of the fiscal year, at a cost well within the estimate.

Winter feeding of lambs proved a good investment, and dairying and poultry suffered least fluctuation. Little was realized from the fruit crop. Interest was manifest in small diversified crops, but lack of capital prevented much expansion.

### Operation and settlement data, Umatilla project

Item	1919	1920	1921	1922	1923
Area for which bureau was prepared to supply water	24,300	24,395	24,400	24,592	24,470
Miles of canal operated	177	177	177	186	188
Acreage irrigated	10,533	12,080	13,150	13,273	13,330
Water diverted (acre-feet)	162,850	165,534	130,872	129,187	127,504
Water delivered to land (acre-feet)	53,500	50,651	57,492	59,318	62,142
Per acre of land irrigated (acre-feet)	5.10	4.21	4.37	4.47	4.63
Total number of farms on project	875	1,000	1,000	1,000	1,011
Population	1,200	1,472	1,562	1,613	1,491
Number of irrigated farms	500	528	544	558	540
Operated by owners or managers	350	450	442	435	418
Operated by tenants	150	78	102	123	122
Population	1,200	1,280	1,562	1,613	1,491
Number of towns	4	4	4	4	4
Population	1,200	1,280	1,280	1,280	1,280
Total population of towns and farms	2,400	2,752	2,842	2,893	2,771
Number of public schools	6	6	6	6	6
Number of churches	9	9	9	9	9
Number of banks	1	1	1	1	1
Total capital stock	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Amount of deposits	\$232,000	\$217,560	\$235,267	\$300,000	\$300,000
Number of depositors	1,129	1,200	1,200	1,200	1,200

## OREGON-CALIFORNIA, KLAMATH PROJECT

The Klamath project is located in southern Oregon and northern California. The project is served by the Southern Pacific and the Oregon, California Eastern Railroads; Klamath Falls with a population of about 5,500 is the principal project city, is the center of an extensive lumber industry, and as a shipping point ranks second in the State.

The average elevation of the irrigable lands is about 4,100 feet above sea level. The principal agricultural products are alfalfa and grain; stock raising is practiced to a large extent; the dairying industry, begun several years ago, is increasing rapidly. The principal markets are Portland, Oreg., Sacramento and San Francisco, Calif. The irrigation season usually begins about May 1, and ends on September 30.

The project derives its water supply principally from Upper Klamath Lake which is situated just north of Klamath Falls. Water for irrigation is diverted into the Main Canal at the lower end of the lake; a short distance below the point of diversion the Main Canal passes under the city of Klamath Falls by means of a concrete-lined tunnel, 3,300 feet in length.

An important feature of the project is the reclamation of the bed of Tule Lake which has no visible outlet. The lands are first uncovered by the prevention of inflow and by evaporation; then the necessary irrigation works constructed. The principal works designed to prevent inflow are Clear Lake and Gerber Reservoirs and the Lost River Diversion Canal. Clear Lake is located on the headwaters of Lost River and is in effect an evaporating basin covering an area of about 25,000 acres; surplus storage is available for the irrigation of about 12,000 acres. The diversion canal connects Lost River with Klamath River and diverts to Klamath River water entering Lost River below Clear Lake Dam.

About 20,000 acres in Langell Valley and 10,000 acres near Bonanza will be watered from Clear Lake Reservoir, Gerber Reservoir, and springs tributary to Lost River.

### ACTIVITIES DURING FISCAL YEAR

*Storage system.*—The contractor for the construction of Gerber Dam started a small crew on March 4 and on June 30 had completed about 85 per cent of the excavation for the foundation. He expected to begin placing concrete in July and to finish the job before winter.

*Tule Lake division.*—The canal and lateral system has been completed for an area of 10,000 acres, which was opened to entry in October, 1922. Work was in progress on the drainage and lateral systems for the lands farther south, excavation for which was being done by Government forces. The total excavation for the year amounted to about 700,000 cubic yards. The structures will be mostly of timber and will be built under contract.

*Langell Valley division.*—On the west side of the valley the work on the irrigation system was virtually completed on June 30, and water was turned into the West Canal early in May. The Dry Lake pumping plant was completed early in June. Most of the irrigable lands have been dry-farmed for years; this year most of the farmers under the West Canal irrigated their lands; otherwise there would have been virtually no returns.

On the east side of Langell Valley, contracts have been let for the diversion dam on Miller Creek and for the excavation for the lateral system. Most of the North Canal will be constructed by dragline excavator operated by Government forces.

*Operation and settlement data, Klamath project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	50,000	50,000	51,000	51,000	<sup>1</sup> 54,171
Acreage irrigated.....	42,881	44,800	44,883	44,929	<sup>2</sup> 47,400
Miles of canal operated.....	225	225	225	225	277
Water diverted (acre-feet).....	119,850	114,179	106,104	119,830	124,137
Water delivered (acre-feet).....	58,490	49,754	48,713	49,862	56,619
Per acre of land (acre-feet).....	1.32	1.11	1.11	1.11	1.21
Total number of farms on project.....	570	570	570	570	600
Population.....	2,000	2,050	2,200	2,200	2,600
Number of irrigated farms.....	540	542	542	542	580
Operated by owners or managers.....	350	352	430	430	450
Operated by tenants.....	190	190	112	112	130
Population.....	1,600	1,650	1,720	1,720	1,800
Number of towns.....	5	5	5	5	5
Population.....	5,300	5,500	5,800	6,200	7,000
Total population, towns and farms.....	7,300	7,550	8,000	8,400	9,600
Number of public schools.....	21	21	22	22	24
Number of churches.....	10	10	10	10	11
Number of banks.....	5	6	5	5	5
Total capital stock.....	\$500,000	\$595,000	\$545,000	\$255,000	\$350,000
Amount of deposits.....	\$4,000,000	\$4,500,000	\$3,600,000	\$3,500,000	\$4,200,000
Number of depositors.....	6,500	9,250	8,000	8,000	8,200

<sup>1</sup> Project proper, 45,300 acres.<sup>2</sup> Includes 9,700 acres of Van Brimmer lands and in miscellaneous pumping districts.**SOUTH DAKOTA, BELLE FOURCHE PROJECT**

The Belle Fourche project is located in western South Dakota, a little north and east of the Black Hills. The district is served by the Chicago & North Western Railway, which runs into the heart of the project, and the Burlington Railway, which runs into the Black Hills. The principal towns are Belle Fourche, Newell, Nisland, and Fruitdale. The source of water supply is the Belle Fourche River. The climate is semiarid, with an average annual rainfall of about 14 inches; the temperature ranges from  $-38^{\circ}$  to  $105^{\circ}$  F. The character of the soils varies from light sandy loam to heavy clay, the clay soils predominating. The duty of water averages 1.5 acre feet per acre. The principal products are alfalfa, wheat, oats, corn, potatoes, sugar beets, garden truck, and livestock, the chief markets for which are Omaha, Minneapolis, and Chicago.

The irrigation plan provides for the diversion of water from the Belle Fourche River by means of a dam about  $1\frac{1}{2}$  miles below Belle Fourche, S. Dak., and an inlet or supply canal about  $6\frac{1}{2}$  miles in length into a storage reservoir, controlled by the Belle Fourche Dam on Owl Creek, a tributary of the Belle Fourche River; the distribution of water from the inlet canal to a small area of land; and the distribution of water from the reservoir through two canal systems on both sides of the Belle Fourche River.

**ACTIVITIES DURING FISCAL YEAR**

The bureau was prepared to deliver water to 81,900 acres in 1923, but owing to a very wet season, only 30,550 acres were actually irrigated. Irrigation began on May 14, and reached a peak on July 25, after which date there was little demand for water because of the continued heavy rains. The excessive rainfall was detrimental to some of the project crops, particularly alfalfa, which deteriorated after harvesting so that less than 50 per cent of the crop was of grade suitable for baling and shipping.

Replacement and repair of decayed wooden structures continued during the year with some important concrete construction on the distribution system. Three Ruth dredgers gave satisfactory and economical results in removing silt and vegetable growths from laterals.

The general unsatisfactory agricultural condition and trend of population into other industries kept land values at bargain prices, and new settlers were slow to take up project opportunities where

many were anxious to let go. Good farms were being rented on terms which brought the owner much less than his assessments for water and taxes. The transfer of inactive tracts into the hands of real dirt farmers would relieve much of the financial distress of those who are attempting to cover too much ground. Some of the project industries were getting on their feet, and the success of farmers who remain should eventually attract more settlers.

*Operation and settlement data, Belle Fourche project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau is prepared to supply water.....	82,634	82,430	83,328	82,190	81,900
Acreage irrigated.....	56,638	58,850	58,100	31,180	30,550
Miles of canal operated.....	615	615	615	615	506
Water diverted (acre-feet) from Belle Fourche River.....	121,293	101,113	86,791	115,629	99,176
Water delivered to farms (acre-feet).....	82,409	36,616	71,715	28,421	22,290
Per acre of land irrigated (acre-feet).....	1.46	0.61	1.3	1.09	0.78
Total number of farms on project.....	1,292	1,292	1,292	1,292	1,292
Population.....	2,675	2,700	2,700	2,700	2,500
Number of irrigated farms.....	1,000	1,024	1,033	1,035	1,035
Operated by owners or managers.....	668	692	451	858	772
Operated by tenants.....	332	332	582	116	188
Population.....	2,597	2,650	2,510	2,213	2,035
Number of towns.....	5	5	5	5	5
Population.....	2,200	2,350	2,386	2,386	2,350
Total population in towns and on farms.....	4,876	5,060	5,086	5,086	4,850
Number of public schools.....	24	26	24	24	25
Number of churches.....	11	9	9	9	9
Number of banks.....	9	9	9	9	6
Total capital stock.....		\$250,000	\$250,000	\$250,000	\$150,000
Amount of deposits.....	\$3,837,680	\$2,657,621	\$2,373,380	\$2,608,200	\$2,145,000
Number of depositors.....		6,580		6,500	5,000

<sup>1</sup> 86 farms not operated.

<sup>2</sup> 75 farms not operated.

<sup>3</sup> Estimated.

## UTAH, STRAWBERRY VALLEY PROJECT

The Strawberry Valley project is located in the north central part of Utah; the irrigable area lies along the southeastern shore of Utah Lake, in Utah County, and the storage works, in Wasatch County, 30 miles east of Springville. The irrigation plan provides for the storage of water in Strawberry Reservoir, the carriage of these stored waters through Strawberry Tunnel, approximately 4 miles long, into Diamond Fork, a tributary of the Spanish Fork River, and the diversion of water from this stream through canal systems to the irrigable area.

The length of the irrigation season is 169 days, from April 15 to September 30. The average elevation of the project lands is about 4,600 feet above sea level. The average rainfall at Payson for a period of 16 years is 18½ inches, most of which occurs from September 1 to May 1. The climate is temperate, varying from 0° to 95° F. The last killing frost in the spring usually occurs prior to May 10, and the first in the fall after October 1. The soil varies from sandy loam to heavy clay and varying mixtures of both, with black alluvium and loam in the bottom lands. The mesa lands are sandy loam underlaid with gravel so that natural drainage is excellent. All soils are easily worked and extremely fertile if properly cultivated, and are suitable for raising any crops that will grow in the Temperate Zone. The principal crops are wheat, oats, barley, millet, alfalfa, timothy, sugar beets, potatoes, corn, cane, apples, plums, pears, peaches, prunes, apricots, cherries, melons, and all kinds of vegetables. Sugar beets, cereals, and hay constitute the staple crops.

The project is traversed by two transcontinental railroad lines, the Denver & Rio Grande Western and the Los Angeles & Salt Lake (Union Pacific System). There is also an electric interurban line connecting the main project towns with Salt Lake City and points in northern Utah.

**ACTIVITIES DURING FISCAL YEAR**

*Operation and maintenance, irrigation system.*—The principal maintenance work was the installation of new trash racks at the intake of the power canal, concrete repair work, and raising the crest of the diversion dam. Four 5 by 8 feet wooden gates were also installed at the lower end of the sand boxes for velocity control in connection with the operation of the new racks.

Precipitation for the year was far below normal, with a very dry spring. Irrigation was resorted to at an early date and delivery of water was begun during the latter part of April. Indications at the close of the year, with an abundance of water in the reservoir, pointed to a fair yield of most crops.

*Operation and maintenance, power system.*—The power plant and transmission lines were in continuous operation, furnishing commercial power to the several towns and communities under the project. New Woodward oil pressure governors were installed in the power plant in connection with the two 500 k. v. a. generator units.

Fifteen hundred feet of 2-inch galvanized pipe were laid, connecting the pump house with the power house and reserve tank, for supplying clear water to the turbine bearings. The plant, with these extensive repairs now complete, is in much better condition for handling the increasing load. Indications pointed to an increasing revenue from the sale of power with a reduction of operation costs.

The season of 1923 was above average in available water supply. Crop production was about normal, with the exception of sugar beets. Financial returns per acre were slightly greater than during the previous year. Project sugar factories experienced a successful season, manufacturing approximately 300,000 bags of sugar.

The livestock industry, with the exception of sheep and lambs, did not materially improve during the year. Poultry and dairy products on the other hand showed excellent returns.

Banking conditions continued to improve. Savings accounts increased and mortgage indebtedness decreased. Federal farm loans at low rates of interest are displacing local mortgages.

The principal industrial development during the year was the construction and blowing in of a 500-ton pig iron furnace and 33 by-product coke ovens by the Columbia Steel Corporation of California. This plant is located midway between Provo and Springville and was put in active operation on April 15, 1924. The successful operation of this industry will open a new and important era in the development of the intermountain region, more especially the adjacent project area.

*Operation and settlement data, Strawberry Valley project*

Item	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water	50,000	53,889	53,889	53,890
Acreage irrigated	<sup>1</sup> 45,450	<sup>1</sup> 47,446	<sup>1</sup> 47,446	<sup>1</sup> 47,460
Miles of canal operated	9.3	9.3	9.3	9.3
Water diverted (acre-feet)	69,100	83,000	79,500	83,800
Water delivered to land (acre-feet)	57,900	71,200	73,401	79,674
Per acre of land irrigated (acre-feet)	1.27	1.50	1.55	1.68
Total number of farms on project	3,000	3,200	3,200	3,113
Population	7,000	7,000	7,000	7,000
Number of irrigated farms	2,700	2,740	2,741	2,741
Operated by owners or managers	2,200	2,340	2,291	2,291
Operated by tenants	500	400	450	450
Population	6,500	6,500	6,500	6,500
Number of towns	12	12	12	12
Population	16,000	16,000	16,000	16,000
Total population of towns and farms	23,000	23,000	23,000	23,000
Number of public schools	22	22	22	23
Number of churches	23	23	25	25
Number of banks	6	6	6	<sup>1</sup> 4
Total capital stock	\$285,000	\$285,000	\$285,000	\$210,000
Amount of deposits	\$2,180,000	\$1,750,000	\$1,900,000	<sup>1</sup> \$1,429,354
Number of depositors	9,880	10,000	10,000	<sup>1</sup> 7,900

<sup>1</sup> Project proper, 34,290 acres.<sup>1</sup> Two bank failures during the year.<sup>1</sup> Figures do not include two banks closed during 1923.**WASHINGTON, OKANOGAN PROJECT**

The Okanogan project is located in Okanogan County, Wash., on a branch line of the Great Northern Railway running from Wenatchee to Oroville, Wash. Towns on the project are Okanogan, Omak, and Riverside. The source of water supply is Salmon Creek with storage in Conconully and Salmon Lake Reservoirs. Water is pumped from the Okanogan River by the Robinson Flat pumping plant, from Duck Lake by the Duck Lake pumping plant, and from two Government wells to supplement the flow of gravity water from the reservoirs. A pumping plant is also operated at the Salmon Lake Reservoir during dry years which pumps water from Salmon Lake below the elevation of gravity flow.

The length of the irrigation season is 153 days from May 1 to September 30. The average elevation of the project is 1,000 feet above sea level; the average rainfall is about 11.5 inches; the temperature ranges from 108° F., to -10° F. The soil is volcanic ash and gravel on the upper benches and sand and gravel on the lowlands along the Okanogan River. The principal crop of the project is apples, with some peaches, pears, small fruits, hay, and vegetables. The principal markets are the States east. The duty of water is 2½ acre-feet per annum at the farm.

**ACTIVITIES DURING FISCAL YEAR**

Approximately 14,500 linear feet of laterals on which excessive seepage losses occurred were lined with concrete. Installation of electric pumping machinery at two additional private wells was completed.

About 2½ acre-feet of water per acre were delivered during the season of 1923, about 875 acre-feet being pumped from below the gate sill of Salmon Lake Reservoir. The snowfall during the winter of 1923-24 was light, the run-off in the spring of 1924 being much less than enough to furnish an adequate water supply. It was expected that not to exceed 8 inches of water per acre would be delivered to subscribed water-right lands during the season of 1924. In addition to the oil engine pumping at Salmon Lake, electrical pumps at Robinson Flat, Duck Lake, and the Government wells augmented the flow of gravity water from Conconully Reservoir. Five private wells were also operated to replace gravity water during the irrigation season within the fiscal year and four additional small private pumping plants during the irrigation season of 1924.

*Operation and settlement data, Okanogan project*

Item	1919	1920	1921	1922	1923
Acreage for which the bureau was prepared to supply water	10,099	8,200	8,200	7,676	7,600
Acreage irrigated	5,859	5,440	5,650	5,570	5,110
Miles of canal operated	79	79	79	79	79
Water diverted (acre-feet)	13,837	8,435	21,866	21,318	20,418
Water delivered to land (acre-feet)	9,937	5,259	16,708	15,395	13,634
Per acre of land irrigated (acre-feet)	1.70	0.96	2.96	2.75	2.64
Total number of farms on project	584	594	1,594	1,473	1,430
Population	1,147	1,150	1,220	1,363	1,430
Number of irrigated farms	407	400	439	1,447	458
Operated by owners or managers	361	350	388	1,390	399
Operated by tenants	46	50	51	57	59
Population	1,147	1,150	1,220	1,363	1,430
Number of towns	3	3	3	3	3
Population	1,520	1,885	2,150	2,300	2,600
Total population in towns and on farms	2,667	3,035	3,370	3,663	4,030
Number of public schools	7	5	6	6	7
Number of churches	8	8	8	8	8
Number of banks	5	5	5	5	5
Total capital stock	\$160,000	\$155,000	\$155,000	\$155,000	\$155,000
Amount of deposits	\$600,000	\$1,050,100	\$1,043,000	\$956,086	\$1,000,000
Number of depositors	1,800	2,100	2,200	2,250	2,350

<sup>1</sup> Figures corrected since last report.

**WASHINGTON, YAKIMA PROJECT**

The Yakima project, comprising the Sunnyside, Tieton, Kittitas, Moxee, Roza, and Kennewick divisions, is located in Kittitas, Yakima, and Benton Counties, Wash. The water supply comes from the Yakima River and its tributaries, supplemented by storage in Keechelus, Kachess, Cle Elum, Bumping, Tieton, and Clear Creek Reservoirs. Sunnyside division diverts water from the east side of the Yakima River at Union Gap for the irrigation of 107,600 acres, and Tieton division from the Tieton River, about 15 miles above its mouth, for 32,000 acres. The project plan provides for the ultimate irrigation of 70,287 acres in the Kittitas division, with diversion from the Yakima River at Easton, 58,350 acres in the Roza division diverting from the Yakima River about 10 miles above Yakima, 35,000 acres in the Kennewick division diverting from the Yakima River at Prosser, and 36,750 acres in the Moxee division with diversion from the Tieton River about 5 miles above its mouth. The Wapato Indian project, now being constructed by the United States Indian Service, diverts water from the west side of the Yakima River at Union Gap for the irrigation of 120,000 acres on the Yakima Indian Reservation.

The irrigation season on the Sunnyside division extends from April 1 to October 31 (214 days) and on the Tieton from April 20 to September 30 (164 days). The water duty on the Sunnyside division is 3 acre-feet per acre and on the Tieton division 2.4 acre-feet per acre. The soil is volcanic ash, sandy loam, and decomposed basalt. The principal products are alfalfa, apples, pears, peaches, grains, potatoes, sugar beets, hops, stock, and dairy products.

Transportation is furnished by the Northern Pacific, Union Pacific, and Chicago, Milwaukee & St. Paul Railways.

**ACTIVITIES DURING FISCAL YEAR**

During the fiscal year construction work was carried on continuously at Tieton Dam. The principal items of work were placing 200,000 cubic yards of rock embankment, 560,000 cubic yards of earth embankment, and 10,500 cubic yards of concrete; excavating 155,000 cubic yards of spillway and cleaning 1,175 acres of the reservoir. Virtually all the operating gates and machinery were purchased or on the job at the end of the year, and the dam was about 80 per cent completed at the close of the fiscal year.

The operating season of the Sunnyside division continued until October 20, 1923. The Granger siphon, providing water for 1,600 acres under the Granger irrigation district, was put in operation at the beginning of the 1924 irrigation season.



Water was turned into the Sunnyside canals on March 10 for the 1924 season. Heavy winds during the spring, carrying weeds into the canals, caused some operating difficulties, and the lack of the usual winter precipitation over the project left the land dry, with a resulting heavy demand for water.

Diversion of water from the Tieton River for irrigation continued from July 1 to October 7, 1923, and began on March 28, 1924, about two weeks in advance of the regular time, owing to the early spring.

Maintenance work included cleaning of silt, willows, and weeds from 335 miles of canals and laterals, the placing of approximately 140 cubic yards of concrete in turnout and diversion structures, the erection of 3,290 linear feet of wood-stave flume, and the installation of 2½ miles of pipe lines for the elimination of open ditches and small wooden flumes.

The Yakima project produced a bumper crop for the year 1923, but met with discouraging marketing conditions. The hay growers organized cooperatively as the Northwest Hay Growers Association, and it was believed that prices had been strengthened by a more orderly system of marketing.

A blight caused by the leaf hopper seriously affected the sugar-beet crop, and only one of the three beet sugar factories in the valley was operated. This has been one of the most profitable crops of the project and it is hoped that through the cooperation of the Department of Agriculture a method of combatting this pest may be discovered in the near future.

*Operation and settlement data, Sunnyside division, Yakima project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water	100,130	100,733	101,509	101,339	95,180
Acreage irrigated	90,000	93,610	94,500	95,000	95,000
Number of farms irrigated	2,810	2,906	3,065	3,138	3,181
Miles of canal operated	605	605	605	605	605
Water diverted (acre-feet)	421,364	417,522	440,348	421,950	432,963
Water delivered to land (acre-feet)	285,215	284,800	309,709	301,838	313,800
Per acre of land irrigated (acre-feet)	3.270	3.040	3.28	3.18	3.30
Total number of farms on project	2,810	2,905	3,065	3,138	3,181
Population	9,477	10,929	12,080	12,332	10,128
Number of irrigated farms on project	2,810	2,905	3,065	3,138	3,181
Operated by owners or managers	2,009	2,272	2,322	2,375	2,157
Operated by tenants	801	633	743	763	1,024
Population	9,477	10,929	12,080	12,332	10,128
Number of towns	13	13	11	11	11
Population	7,650	6,941	6,941	7,250	7,250
Total population of towns and on farms	17,127	17,870	19,021	19,582	17,378
Number of public schools	37	40	41	41	41
Number of churches	30	30	30	30	30
Number of banks	13	13	13	12	12
Total capital stock	\$400,000	\$380,000	\$397,000	\$360,000	\$300,000
Total amount of deposits	\$4,388,610	\$2,695,848	\$2,914,608	\$2,615,415	\$2,281,606
Total number of depositors	11,182	11,556	11,643	10,556	9,348

*Operation and settlement data, Tieton division, Yakima project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau was prepared to supply water.....	32,000	32,000	32,000	32,000	32,000
Acreage irrigated.....	27,000	28,000	28,500	28,700	28,350
Miles of canal operated.....	335	335	335	335	335
Water diverted (acre-feet).....	98,223	96,806	100,844	98,754	96,541
Water served to land (acre-feet).....	70,776	69,471	71,148	71,106	72,182
Per acre of land irrigated (acre-feet).....	2.62	2.47	2.50	2.48	2.55
Total number of farms on project.....	1,480	1,480	1,480	1,480	1,480
Population.....	2,860	3,314	3,457	3,542	3,453
Number of irrigated farms.....	1,263	1,340	1,300	1,300	1,305
Operated by owners or managers.....	908	1,048	1,010	965	875
Operated by tenants.....	350	292	290	335	430
Population.....	2,860	3,314	3,457	3,542	3,453
Number of towns.....	8	8	8	8	8
Population.....	23,000	23,000	23,000	23,000	23,000
Total population of towns and on farms.....	25,860	26,314	26,457	26,542	26,453
Number of public schools.....	10	10	10	10	10
Number of churches.....	3	3	4	4	4

**WYOMING, RIVERTON PROJECT**

The Riverton project lies in Fremont County, Wyo., northeast of Wind River and west of the Big Horn River. Adjacent towns on the Chicago & North Western Railway are Riverton and Shoshoni with estimated populations of 2,000 and 500. The source of water supply is Wind River. The irrigation season is from May 1 to September 30. The average altitude is 5,200 feet; the average annual rainfall is about 8 inches; the average maximum temperature is about 95° F.; and the average minimum temperature -27° F. The soil is a heavy loam. The principal products are alfalfa, cereals, sugar beets, and potatoes; and the principal markets, Omaha, Denver, and local. The estimated duty of water is 2 acre-feet per acre per annum at the farm.

The flood waters of Wind River, Bull Lake Creek, and Dinwoody Creek will be stored in Pilot Butte, Bull Lake, and Dinwoody Reservoirs. The waters of Wind River will be diverted into the Wyoming Canal, serving the entire project.

**ACTIVITIES DURING FISCAL YEAR**

Structures on the first 10 miles of the Wyoming Canal were nearly completed.

Work was begun in December, 1923, on the intake and outlet works of the Pilot Butte Reservoir and was continued during the remainder of the year.

Work was begun in September, 1923, on the Pilot Butte hydro-electric power plant and was nearly completed. Power from this plant will be used in completing the construction of the project; 28 miles of permanent, 33,000-volt transmission line were constructed.

*Settlement data, Riverton project*<sup>1</sup>

Item	1919	1920	1921	1922	1923
Number of towns.....	2	2	2	2	2
Population.....	2,500	2,500	2,500	2,500	2,500
Number of public schools.....	2	2	2	2	2
Number of churches.....	7	7	7	7	7
Number of banks.....	5	5	5	5	5
Total capital stock.....	\$110,000	\$135,000	\$135,000	\$135,000	\$135,000
Amount of deposits.....	\$1,200,000	\$1,500,000	\$900,000	\$1,000,000	\$1,000,000
Number of depositors.....	2,700	2,600	2,200	2,200	2,800

<sup>1</sup> Project in process of construction, no water deliveries.

<sup>2</sup> Estimated.

## WYOMING, SHOSHONE PROJECT

The Shoshone project is located principally in Park and Big Horn Counties, Wyo., with a small area in Carbon County, Mont., and consists of the Garland, Frannie, Willwood, and Heart Mountain divisions. Irrigation works have been constructed which provide for the delivery of water to about 68,800 acres under public notice in the Garland and Frannie divisions, and work is under way to provide for the irrigation of about 15,600 acres in the Willwood division. Water is obtained from the Shoshone River and storage is provided in the Shoshone Reservoir, created by the Shoshone Dam, located 8 miles west of Cody, Wyo., to supplement direct flow rights from the river.

The irrigation plan contemplates three diversions from the river. The first diversion, that for the proposed Heart Mountain division, will be located at the Shoshone Dam. No work has been undertaken on this feature except the surveys and a short outlet tunnel at the Shoshone Dam. The second diversion, which has been in operation since 1908, is located at the Corbett Dam on the Shoshone River, 16 miles below the Shoshone Dam, for the irrigation of lands in the Garland and Frannie divisions. The third diversion is effected by the Willwood Dam on the same stream, 8 miles below the Corbett Dam. This dam has been completed and work is well under way on the construction of canals and laterals to provide water for the lands of the Willwood division on the south side of the Shoshone River.

The annual rainfall on the project lands averages 5.5 inches and the average elevation is about 4,500 feet above sea level. Temperature record over a period of 16 years shows a mean maximum of 97.9° F. and a mean minimum of -19.7° F. The principal agricultural products on the developed part of the project are alfalfa, wheat, oats, potatoes, sugar beets, and beans. On the Garland and Frannie divisions the amount of water delivered to the farms has averaged 2.34 acre-feet per acre irrigated. Transportation facilities are provided by the Chicago, Burlington & Quincy Railroad; and the principal markets are Billings and Butte, Mont.; Casper, Wyo.; Omaha, Nebr.; and Kansas City, Mo. The principal project towns are Powell, Deaver, and Frannie, Wyo.

### ACTIVITIES DURING FISCAL YEAR

*Willwood division.*—The Willwood Dam was completed and the construction plant dismantled during the fore part of the year. Excavation of the main canal and several large cross drains was carried on with one dragline working practically the entire year. Earthwork on the lateral system was carried on by small contractors. The construction of a large flume across C-J coulee near the upper end of the main canal was completed by Government forces and under contract. Work was also being carried on by contract on a portion of the lateral system structures.

*Garland division.*—Twenty-two and seven-tenths miles of open drains and 15.3 miles of closed drains were constructed during the fiscal year.

*Frannie division.*—Four dragline excavators were employed during 1923 and two during 1924, constructing 27.4 miles of open drains.

No new lands were opened to entry on the project during the year nor was there any activity in the settlement of lands open to entry or in the sale of town lots in the Government town sites of Frannie, Deaver, and Powell.

On the Garland division the total acreage cropped was about the same as in 1922. Crop yields were good and all produce except sugar beets sold at higher prices than have prevailed since 1920. The average crop value per cropped acre in 1923 on this division was \$27.02, an increase of 32 per cent over 1922. The 1923 value is practically the average for the last 10 years, indicating a return to somewhat nearly normal conditions.

On the Frannie division the acreage cropped decreased 15 per cent. Increased returns for produce brought the total cropped value up to within 3 per cent of the 1922 returns. The 1923 average acreage value was \$14.81, or 55 per cent of that of the Garland division. Many farms on the division were abandoned, at least temporarily, and many others were very poorly farmed.

Public notice No. 30, issued February 7, 1924, gave the water users the option of accepting a temporary suspension of the regular public notices, pending the reclassification of the irrigable area of the division. Public notice No. 32, issued April 11, 1924, provided for the delivery of water on a rental basis, payments to be made in advance but purchase to be allowed in quantities as small as 20 acre-feet. The former public notice has been accepted generally by the water users remaining on the division and has renewed their vigor in the combat of the problem of establishing productive homesteads. The advance crop report for 1924 shows 6,750 acres cropped.

*Operation and settlement data, Shoshone project*

Item	1919	1920	1921	1922	1923
Acreage for which bureau is prepared to furnish water	56, 119	65, 890	65, 826	71, 223	70, 350
Acreage irrigated	41, 641	45, 650	45, 420	42, 870	38, 650
Miles of canal operated	415	458	460	457	452
Water diverted (acre-feet)	199, 061	187, 329	221, 419	192, 851	176, 198
Water delivered to land (acre-feet)	117, 459	113, 065	112, 324	99, 170	91, 082
Per acre of land irrigated (acre-feet)	2.81	2.50	2.47	2.33	2.36
Total number of farms on project	823	1, 009	1, 005	1, 083	1, 071
Population	2, 481	2, 730	2, 686	2, 444	2, 025
Number of irrigated farms	803	910	935	914	838
Operated by owners or managers	619	605	646	606	426
Operated by tenants	184	215	289	218	412
Population	2, 481	2, 730	2, 686	2, 444	2, 025
Number of towns	5	5	5	5	5
Population	1, 395	1, 345	1, 541	1, 585	1, 705
Total population of towns and farms	3, 876	4, 075	4, 227	4, 029	3, 730
Number of public schools	11	12	7	7	7
Number of churches	8	8	8	8	8
Number of banks	5	6	5	4	3
Total capital stock	\$110, 000	\$125, 000	\$110, 000	\$100, 000	\$85, 000
Amount of deposits	\$955, 000	\$944, 000	\$543, 000	\$441, 000	\$466, 000
Number of depositors	2, 500	2, 605	2, 400	2, 400	2, 300

## COOPERATIVE INVESTIGATIONS AND PROPOSED PROJECT EXTENSIONS

NOTE.—A description of secondary projects and investigations carried on under cooperative contracts will be found in previous annual reports. The following discussions are limited to those projects and investigations on which work was done during the fiscal year ending June 30, 1924. Authorization for this work is provided in the acts of Congress approved January 24, 1923 (42 Stat. 1174), and February 21, 1923 (42 Stat. 1231). The cost of investigations designated (a) were paid from the appropriation for General Investigations, 1923-24, as provided in the act approved March 4, 1923 (42 Stat. 1527).

### ARIZONA

#### BOULDER CANYON RESERVOIR INVESTIGATIONS

By the provisions of the Kincaid Act (41 Stat. 600), Congress in 1920 authorized and directed an examination and report by the Secretary of the Interior on the condition and possible irrigation development of the Imperial Valley in California. The act provided that the Secretary should report as to the feasibility of providing storage

for these lands and the effect of such storage on irrigation development elsewhere in the Colorado River Basin. The authorization and program of investigation have been continued with annual appropriations made in pursuance of that law and with funds provided through cooperative agreements with the Imperial irrigation district, the Coachella Valley County water district, the Palo Verde joint levee district, and the cities of Los Angeles and Pasadena.

During the past year office studies have been continued to define the most economical use of water for irrigation and power development, considering storage in reservoirs of varying capacities at all sites suggested as feasible and the order in which the development should proceed. These studies included those of irrigable areas, water supply, flood control, power development, and designs and estimates of dams of various heights and types at Lees Ferry, Diamond Creek, Bridge Canyon, Spencer Canyon, Devils Slide, Boulder Canyon, Black Canyon, Bulls Head, Mohave Canyon, and Parker. Tests of materials for use in construction at the dam sites in Boulder and Black Canyon were made by the Bureau of Standards and surveys were made of salt claims in the reservoir site.

The chief engineer submitted report on the problems of the Colorado River Basin to the Commissioner, Bureau of Reclamation, on February 28, 1924.

A committee of engineers consisting of Spencer Cosby, Corps of Engineers, United States Army; William Kelly, chief engineer, Federal Power Commission; F. E. Weymouth, chief engineer, Bureau of Reclamation; Herman Stabler, chief land classification branch, Geological Survey; and E. B. Debler and Walker R. Young, engineers, Bureau of Reclamation, was appointed by the Secretary of the Interior to consider the problems of the Colorado River and made report under date of March 17, 1924. The report of the committee was submitted by the Secretary of the Interior to Congress on March 17.

#### COLORADO RIVER DIVERSIONS

The results of these investigations, which were in progress during 1922 and 1923, are given in report of the Arizona engineering commission consisting of E. C. La Rue, of the United States Geological Survey; Porter J. Preston, of the Bureau of Reclamation; and H. E. Turner, of the State water commissioner's office.

Irrigation of large areas in Gila River Basin by diversion from the Colorado River above Needles was found infeasible. An alternative plan with diversion at Parker, covering a smaller area, was presented and recommended for further investigation.

Irrigation possibilities are also treated covering proposed projects in the Cottonwood, Mohave, Blankenship, Chemehuevi, Parker, and Cibola Valleys as well as a number of miscellaneous areas in Arizona. The work was completed and report transmitted to the Governor of Arizona and the Bureau of Reclamation on July 5 1923.

#### COLORADO RIVER TRIBUTARIES

This investigation which was begun during the past year was completed and report dated September, 1923, covering irrigation possibilities on the Virgin, Little Colorado, and Williams Rivers in Ari-

zona, Utah, and Nevada, was transmitted to the commissioner on October 8, 1923. Erratic water supply and excessively silt-laden streams present unfavorable conditions for further development.

### CALIFORNIA

#### SACRAMENTO VALLEY INVESTIGATIONS

These investigations are being made under a cooperative contract dated January 26, 1924, between the United States, the department of public works, division of engineering and irrigation of the State of California, and the Sacramento Valley Development Association, providing for the continuation of cooperative investigation of the proposed Iron Canyon project and of proposed control works for preventing incursion of salt water into the delta region of the Sacramento and San Joaquin Rivers in California.

The sum of \$40,000 has been made available for the investigations, \$20,000 of which was allotted by the Secretary of the Interior from the appropriation made for miscellaneous investigations of reclamation projects pursuant to acts of Congress dated February 21 and March 4, 1923. The State department of public works and the Sacramento Development Association have each made available the sum of \$10,000.

Results of previous investigations on the Iron Canyon project are given in report of May, 1920, by H. J. Gault, engineer of the Bureau of Reclamation, and W. F. McClure, State engineer of California. The investigation under way involves consideration of the feasibility of a low line canal in place of the high line adopted in the previous report.

A field office was established at Berkeley, Calif. Preparations have been made for developing the foundation conditions at three of the possible sites for the salt water barrier and the work of preparing preliminary designs and estimates has been started.

#### CALIFORNIA POWER INVESTIGATIONS

A board consisting of Maj. U. S. Grant, 3d, United States Army; E. W. Kramer, hydroelectric engineer, United States Forest Service; and D. C. Henny, consulting engineer, Bureau of Reclamation, chairman, representing departments of the Federal Government, and W. F. McClure, chief of division of engineering and irrigation of California, was appointed by the Federal Power Commission to study various streams in California and make recommendations regarding the best uses to be made of the water.

*Trinity River.*—The first study undertaken related to the Trinity River, in northern California, a tributary of the Klamath River. The principal feature considered was the desirability of tunnel diversion to the upper Sacramento River and its effect upon irrigation and power development and on navigation at the mouth of the Trinity River. The first meeting of the board was held on July 13, 1923, and the work was completed and report made on February 18, 1924.

*American River.*—The study of the American River was taken up in September, 1923, and a report made to the Federal Power Commission on May 19, 1924.

*North Fork Stanislaus River.*—Field examination was made by the board in September, 1923. A report is in process of preparation.

## COLORADO

## SAN LUIS VALLEY INVESTIGATIONS

The San Luis Valley comprises considerably over a million acres of smooth, irrigable land lying in a compact body in the south central part of Colorado, near the State line. The best information available indicates that about 425,000 acres are now being irrigated. The irrigation of additional land in the valley depends on water supply available after other prior rights in the Rio Grande Basin have been satisfied. Large areas in the valley need drainage. The study of water supply for additional irrigation in the valley was taken up by the Bureau of Reclamation in 1910, and again in cooperation with the Department of Agriculture in 1912 (see fifteenth annual report).

During the year 1919, engineers of the Bureau of Reclamation made a study of the water supply and possible development of the entire Rio Grande drainage basin (see twentieth annual report). Since 1919 large areas have been drained by private enterprise.

Return flow from drains constructed has encouraged Colorado to revive the question of further development in the valley. On account of the complexity of the problem, both human and physical, the States of Colorado and New Mexico have passed laws authorizing the appointment of commissioners from each State for the purpose of effecting an agreement as to the division of the water of the stream, and the State of Texas and the Federal Government have been invited to join in the negotiations. Herbert Hoover has been selected to represent the United States, Delph Carpenter the State of Colorado, and J. O. Seth the State of New Mexico.

Upon instructions of the Secretary of the Interior, the chief engineer and field commissioner of the Bureau of Reclamation visited the San Luis Valley from October 31 to November 3, 1923, inclusive.

Further engineering investigations were advised, to determine the consumptive use of water in San Luis Valley and the amount of water which would be available for use below San Luis Valley, that would be picked up by a proposed large drain through the trough of the valley, and to make an estimate of the cost of such a drain.

Engineers are now in the field collecting data necessary in connection with various claims to water in Rio Grande Basin.

## BADITO PROJECT

The Badito project includes 40,000 acres of public lands in Pueblo and Huerfano Counties, Colo., that were withdrawn from entry under the Carey Act in 1911. The project is dependent upon flood flows of the Huerfano River for its water supply, the normal discharge of the river having long ago been appropriated.

The reclamation works proposed consisted of a reservoir with a storage capacity of 34,000 acre-feet and about 20 miles of carrying canals from which numerous laterals were to distribute water to the irrigable lands.

Early in 1923, the promoters of the Carey Act project informed the department that they were unable to finance its construction and, together with officials of the State of Colorado, suggested that its development be undertaken under the terms of the reclamation act. The Carey Act segregation was canceled and the lands which it

embraced were simultaneously covered by reclamation first form withdrawal "to permit the State and Government to consider the possibility of their reclamation."

On October 2, 1923, the Secretary of the Interior ordered an investigation of the Badito project by the Bureau of Reclamation. After a field reconnaissance and a study of all available data relative to water supply and existing appropriations, a report was submitted to the Secretary on February 25, 1924, showing that water rights for direct irrigation and storage had been decreed in excess of both the normal and flood flows of the Huerfano River and that the cost of construction would be excessive.

By departmental order of March 13, 1924, the lands were released from the reclamation withdrawal and opened for disposition under the homestead and other applicable laws.

#### UPPER WHITE RIVER PROJECT

This project is located in Rio Blanco and Moffat Counties, the irrigable areas being located in Little Beaver Basin east of Meeker and in Axial and Dry Lake Basins south of Craig and Maybell. The irrigation plan contemplates diversion from the North Fork of the White River just below Marvine Creek, conveying the water by means of a tunnel through Yellow Jacket Pass to the Thornburgh (Pass Butte) Reservoir. This diversion canal will supply water to the Little Beaver Basin. The main canal for the Axial and Dry Lake Basins will divert from Milk Creek a few miles below the Thornburgh Reservoir, running in a general northwesterly direction and tunneling Juniper Mountain for the irrigation of the latter basin. The project is limited by water supply to about 52,000 acres. The preliminary report of June, 1924, indicates the cost of construction to be in excess of the benefits to accrue to the land, and therefore the project is considered infeasible.

#### IDAHO

##### BOISE PROJECT EXTENSION, BLACK CANYON DIVISION

The Black Canyon division, located between the Boise and Payette Rivers, includes an area of about 60,000 acres of new lands, of which 32,000 acres can be covered by gravity from the Black Canyon diversion dam, and the balance requires a pumping lift of 75 to 100 feet.

The diversion dam is practically complete and in operation in the service of the Emmett irrigation district, and half of the cost will be carried by that district. Development of electrical power for pumping on the higher lands of the Black Canyon district is planned at the diversion dam.

During the year careful, detailed surveys were made to determine the probable cost of the main canal, which is an expensive feature. Field work also included a general layout of the distribution system, pumping plants, and boundary of irrigable lands. Study of the water supply and examination of several storage sites were made. A report dated June 8, 1924, included all of the information available to date.



**DUBOIS PROJECT**

The work on this investigation, which was begun during the preceding fiscal year under contract with the Dubois Finance Association, was carried on during the past fiscal year with funds allotted from the appropriation for secondary investigations. A traverse on the 6,170 contour was run around the Island Park Reservoir site. A profile was run over the route of the proposed outlet tunnel under Big Bend Ridge and a trial line from the mouth of the tunnel to Medicine Lodge divide. A study of geological conditions surrounding Island Park damsite, reservoir, and outlet tunnel was made by Harold T. Stearns of the United States Geological Survey. A drilled test hole penetrated 75 feet of loose cinders directly beneath a thin layer of basaltic rock in the river bed. The general conclusion of the report was unfavorable to the watertightness of the damsite and reservoir site.

**MOUNTAIN HOME PROJECT**

The cooperative investigation of this proposed project under contract with the Boise Chamber of Commerce was completed, and the results of the survey are contained in report dated September 13, 1923, copies of which were transmitted to the commissioner and the contractor.

The irrigable area was found to be largely in excess of the area that could be reclaimed safely with the available water supply.

On account of the many construction difficulties to be encountered the estimated cost of the project makes its construction probably prohibitive at this time.

**MONTANA****BLACKFEET WATER SUPPLY INVESTIGATION**

A contract was executed under date of August 22, 1923, by the Commissioner of Indian Affairs and the Toole County irrigation district in accordance with the act of Congress approved February 26, 1923 (42 Stat. 1289). This investigation consisted of a field survey of possible diversions from streams flowing on the Blackfoot Indian Reservation and lands irrigable therefrom. A report was completed in June, 1924, giving the results of the survey and studies of water supply necessary for the irrigation of the irrigable lands on the reservation.

**NEBRASKA****TRI-COUNTY PROJECT**

The Tri-County project is located in the south-central part of Nebraska, in Gosper, Phelps, Kearney, and Adams Counties.

The investigations were initiated by the Central Nebraska Supplemental Water Association in securing the passage, in the Sixty-seventh Congress, of Senate Joint Resolution 215. This act authorized the Secretary of the Interior to make the investigations with funds to be provided by the association. Under deposit of \$5,000, made by the association, the field work on these investigations, which was started in November, 1922, was continued to June 1,

1923. A contract between the Bureau of Reclamation and the association, made effective August 1, 1923, provided for the allotment of \$5,000 from the general investigations fund and \$5,000 to be deposited by the association. Under this contract the work was carried to completion.

The water supply for the project as proposed will be derived from the Platte River and impounded in reservoirs in the Plum Creek Basin, where two sites were located, having an aggregate storage capacity of 509,000 acre-feet. The irrigable area of the project, under the largest scheme of development proposed, comprises 449,000 acres of level table lands between the Platte and Republican Rivers. An investigation was made of five schemes of development which lend themselves, as successive construction steps, toward the ultimate project development.

The Department of Agriculture in cooperation with the State College of Agriculture carried on investigations and experiments to determine the water-holding capacity of the subsoil, and their report on the following phases of the project was issued:

(a) The average monthly deficiency of rainfall during the growing season.

(b) The water-holding capacity of the subsoil.

(c) The approximate amount of water needed to supplement rainfall.

(d) The approximate increase in crop production made possible by subsoil storage.

The duty of water as established by the Department of Agriculture is one foot per acre, measured at the land.

In conjunction with irrigation, the possibilities of electrical power development were investigated and covered by the report. Work was completed and final report showing the results of the investigations was released in May, 1924.

## NEVADA

### COLORADO RIVER TRIBUTARIES

The results of the investigation of storage and irrigation possibilities in the Virgin and Muddy Valleys in Nevada and Arizona are given in a report dated September, 1923. The results of these investigations were not encouraging.

## NEW MEXICO

### CARLSBAD EXTENSION, PECOS RIVER INVESTIGATIONS

The results of an examination of the geology underlying the proposed No. 3 reservoir site, which is the only basin on the lower Pecos River above the Carlsbad project, are given in a report dated November, 1923, by Willis T. Lee, with the concurrence of N. H. Darton and G. B. Richardson, all geologists of the United States Geological Survey.

This report, although favorable to a reasonably satisfactory dam site, indicates that with storage to the required depth the gypsum and limestone formations in the site will probably be subject to serious leakage and the site therefore unfavorable for holding water

for the storage requirements of the project. Plans and estimates for the construction of a dam for various capacities at this site have been prepared, but on account of the unfavorable geological conditions it is probable that storage of flood waters of this river must be confined to sites located on the upper river above the gypsum and limestone formations.

A suitable site above Fort Sumner, N. Mex., has been investigated and estimates have been prepared for various capacities.

#### PENASCO PROJECT

Investigation of the feasibility of irrigation from the Penasco River in the vicinity of Hope, N. Mex., were continued. Field work with the exception of stream gaging was completed in August, 1923. The report just completed deals principally with the history of irrigation development on the Hope project, and the feasibility of storage to provide a supplemental supply for the area now under cultivation. The unregulated discharge of the Penasco River has provided late summer and winter irrigation at a minimum cost for an area of 1,000 to 8,000 acres since 1895, but only fragmentary run-off data are available prior to 1921, and hydrographic records are available for only the past three years. This period is not sufficient on which to base reliable estimates of the annual yield of the watershed.

The sites where storage may be obtained are of limited capacity and high cost, on account of steep gradients and narrow valleys, and it is doubtful if the project can safely undertake their construction. To provide for an increased area would require hold-over capacity for the storage of flood waters for two to five years or more. This cost would be excessive and permanent storage is also of doubtful feasibility on account of the high silt content of the flood waters.

#### NEW MEXICO-COLORADO

##### SAN JUAN BASIN INVESTIGATIONS

Investigations were conducted in the San Juan Basin in southwestern Colorado and northwestern New Mexico under a cooperative contract with the State of New Mexico, dated September 12, 1923. This investigation was suggested by the State engineer of New Mexico. The first step taken was to make a reconnaissance of the basin to determine the most probable project that would cover lands in New Mexico, with the result that the Animas project diverting from the Animas River to the west was selected.

Surveys were begun in July and completed the last of November, 1923. These surveys include 170 miles of adopted canal lines in addition to various alternate lines, and a plane-table survey of the irri-gable area which was found to be 60,000 acres, net.

The principal features of the project are: the Animas reservoir of 100,000 acre-feet on the Animas River; a diversion dam in the Animas River; a main canal 45 miles in length from the Animas River, discharging into the La Plata River; a diversion dam in the La Plata River; a main canal 12 miles in length from the La Plata River to the west; the Meadows Reservoir of 10,000 acre-feet capacity; 113 miles of principal distributory canals and laterals; and a drainage system for the lower end of the project.

The project is limited by acreage rather than by water supply which is sufficient for more than double the above acreage. The project could be extended to the west to cover an additional 75,000 acres; this would materially lessen the cost per acre. This extension was not surveyed as it would cover lands in the Navajo Indian Reservation, and permission for such survey was withheld by the Bureau of Indian Affairs.

The report on the Animas project was practically completed at the end of the fiscal year.

## **NEW MEXICO-TEXAS**

### **PECOS RIVER COMPACT**

In March, 1923, the Governors of New Mexico and Texas approved acts passed by the legislatures of those States providing for the appointment of commissioners to negotiate an agreement concerning the storage, division, and use of the waters of the Pecos River in New Mexico and Texas. Each legislative enactment provided that a representative of the United States should meet with the commissioners of the two States interested.

Hon. R. E. Thomason of El Paso was appointed commissioner for the State of Texas and Hon. Richard H. Hanna commissioner for the State of New Mexico. C. T. Pease, an engineer of the Bureau of Reclamation, was designated by the Secretary of the Interior to represent the United States.

The commission held its first meeting at El Paso late in July, which was attended by numerous water users from Texas and New Mexico. The first two weeks in August were devoted to an inspection of the Pecos watershed and existing irrigation systems.

The commission then ordered the compilation of a memorandum giving all the principal data contained in a number of reports which were available and the preparation of a questionnaire to be sent to each irrigation association along the river.

Further action by the commission is awaiting reports from the engineers employed by the water users and the States. When these are received a form of compact and report will be submitted to the Secretary of the Interior and to the Governors of New Mexico and Texas.

## **OREGON**

### **FURNISH AND WESTLAND PROJECTS**

A contract dated October 4, 1923, provided for \$1,000 to be furnished by the Stanfield district and \$1,000 by the Bureau of Reclamation for the investigation of the cost of reconstruction of this system. The investigation was completed and report made March 5, 1924. This report was reviewed in June, 1924.

A study of the duty of water on the lands in the Westland irrigation district has been in progress, and an estimate of cost of the enlargement and extension of the Western canal and for the distribution system for new lands completed and report made in June, 1924. Lands involved in securing storage from the McKay Reservoir under construction aggregate 40,000 acres, and are adjacent to the present Umatilla project.

**BAKER PROJECT**

This project is discussed in the introduction to this report, page 16.

**VALE PROJECT**

This project is discussed in the introduction to this report, page 20.

**OREGON-CALIFORNIA****KLAMATH PROJECT, PUMPING DIVISION**

The lands included in the pumping division have a total area of about 20,000 acres. There are 14 separate areas adjacent to project canals, varying in size from about 200 to 4,000 acres; proposed lifts are from 25 to 70 feet. The Malin irrigation district, the Shasta View irrigation district, and the Sunnyside irrigation district have executed contracts with the United States for a water supply. The Sunnyside irrigation district is actually watering about 475 acres. No construction has been done by the Malin or Shasta View districts. During the year 1923 efforts were made by these two districts to sell bonds, but satisfactory sales could not be made.

**KLAMATH PROJECT, LOWER KLAMATH LAKE DIVISION**

There are about 76,000 acres, gross, of marsh lands in this division; 27,000 acres are in Oregon within the boundaries of the Klamath drainage district and 49,000 acres in California. The Klamath drainage district has contracted for a water right from the United States and is proceeding to construct its own drainage and irrigation system. The ownership of a large portion of the marsh lands in California is in doubt. The area involved is claimed by both the State and the United States. It will take court action to determine the ownership.

During October, 1923, Prof. Chas. F. Shaw of the University of California, made an investigation of soil and agricultural conditions of the marsh lands of California. Report was made to the chief engineer under date of December 7. His conclusions were that the marsh lands in California did not offer attractive possibilities for development in the near future.

**OREGON-IDAHO****OWYHEE PROJECT**

This project is discussed in the introduction to this report, page 18.

**OREGON-WASHINGTON****UMATILLA RAPIDS PROJECT**

The investigation of the Umatilla Rapids project as outlined in the twenty-second annual report was continued throughout the year. Extensive diamond drill borings were made at the dam site and preliminary canal lines were run in the field for the development, by pumping for irrigation, of extensive areas of agricultural land in the States of Oregon and Washington.

All field work was completed about April 1, 1924, after which date designs and estimates of cost for the dam and power house, pumping plants, canals, and canal structures were in progress. At the close of the fiscal year designs and estimates were nearly complete and the preparation of the report was under way.

Under a cooperative contract the State of Oregon contributed \$10,000 to assist in carrying out the investigations.

### TEXAS

#### RED BLUFF RESERVOIR

The report on the geology at the dam site drilled in 1922 was made by Willis T. Lee of the United States Geological Survey in November, 1923. N. H. Darton, who had made an examination and a preliminary report in 1922, concurred with Mr. Lee in his opinion that the site was unsatisfactory for the construction of a tight reservoir. At the request of the Pecos Valley Water Users' Association of Texas, three other sites selected were drilled during the fall of 1923 and the spring of 1924, without finding satisfactory material for a tight dam site or reservoir. A complete record of the dam sites drilled will be compiled for future reference.

### UTAH

#### SALT LAKE BASIN PROJECT

This project is discussed in the introduction to this report, page 23.

#### CACHE VALLEY INVESTIGATIONS

These investigations are being conducted under cooperative contracts between the United States and the State of Utah. The irrigable lands are located in Cache County in northern Utah. At present a large part of the area has an early or flood water right, the irrigation plan contemplating the supplementing of this early right with a late storage water right and a full water right to the lands at present with no water right at all. Four storage sites have been surveyed on the Logan River and two on the Little Bear River; also enlargements of present canals or entirely new canals have been surveyed for conveyance of the water to the areas on both sides of the valley. The irrigable area in the project amounts to approximately 66,000 acres. The preliminary report will be made during the fiscal year 1925.

#### SPANISH FORK—LEHI DRAINAGE INVESTIGATIONS

Reading and recording of water levels in observation holes on the area under investigation were carried on until December 31, 1923, when the work was discontinued.

#### UTAH LAKE INVESTIGATIONS

During July, 1923, 61 soil samples were taken from the bottom of Provo Bay, which it is proposed to separate from Utah Lake by

diking, and forwarded to the Bureau of Soils, at Washington, D. C., for analysis. Points where samples were taken and soundings made were located by resection on plane-table in boat.

Complete water supply studies in connection with Strawberry Reservoir, Spanish Fork River, and Willow Creek were begun during the latter part of the year.

These studies are being made to determine the probable amount of water from these sources available for irrigation use on lands outside the Strawberry Valley project in Utah and Salt Lake counties.

#### CASTLE PEAK PROJECT

Runoff records for securing water supply data were continued throughout the year.

#### PRICE RIVER PROJECT

No work in connection with this project was undertaken by the Bureau of Reclamation during the year; however, the district drilled and tested the Pleasant Valley dam site on Fish Creek and through the sale of district bonds to the contractor is undertaking the construction of a rock-fill dam at this point.

#### UTAH—COLORADO

##### LOWER WHITE RIVER INVESTIGATIONS

These investigations have been conducted under cooperative contracts between the United States and the State of Utah. The lands to be irrigated are located in Colorado as well as Utah. In 1922, a canal location was made for the use of White River water for the irrigation of the project. During 1923, a canal location was run for diverting water from the Yampa River. In each case the canal locations cross very rough, mountainous land requiring a large amount of tunneling and concrete bench fluming. The irrigable area in the project varies from 77,600 acres to 85,500 acres under different schemes investigated. In March, 1924, a preliminary report was made indicating that on account of the cost, the irrigation of the project by water from either source would be infeasible.

#### WASHINGTON

##### COLUMBIA BASIN PROJECT

The investigation of this project is being made under the act of Congress of February 21, 1923, making a special appropriation of \$100,000 for this purpose. The work is directed by a committee consisting of F. M. Goodwin, Assistant Secretary of the Interior, the Commissioner, and the chief engineer of the Bureau of Reclamation. The Bureau of Soils and the Geological Survey have cooperated with the Bureau of Reclamation in this investigation.

During the summer and fall of 1923 field surveys of the soils, geology, water supply, and storage possibilities were completed and dams and canals located for the project. Test borings by diamond drill were made at 7 dam sites and 49 holes were drilled.

Estimates of the cost of the project by various plans were made and reports prepared on the several engineering and construction features and costs; soil survey and land classification; geologic conditions affecting reservoirs, dams, and tunnels; and water supply, storage, and power possibilities.

A board of engineers reviewed the above feature reports and submitted their conclusion to the Chief Engineer on April 6, 1924. Further conferences of consulting engineers are contemplated before the final report of the investigation is prepared. The field office at Spokane was closed in February, 1924, and the remainder of the office work was done in the Denver office.

#### YAKIMA PROJECT EXTENSIONS

Proposed extensions to the Yakima project include four divisions, the Kittitas, Roza, Moxee, and Kennewick.

A board of engineers, on October 15 to 24, 1923, reviewed the plans and estimates for the four divisions, held hearings, and visited each of the divisions in order to determine which should be constructed first. Their recommendation favored the Kittitas division, which is discussed in the introduction to this report, page 12.

A topographical map of the Kennewick division was completed during October and November; this was the only work performed on any of the extensions during the fiscal year.

#### EXPERIMENTAL INVESTIGATIONS

Since the establishment of the Bureau of Reclamation considerable experimental work has been in progress to determine constants and coefficients to be used in designing irrigation structures. During the past year particular attention has been given to the consumptive use of water, determining the coefficients of roughness for channels and conduits, and coefficients of discharge for measuring devices.

During the fiscal year 1924, duty of water studies have been under way on the Yakima, Shoshone, and Rio Grande projects, and experiments for the determination of friction, bend, and transition losses, on the King Hill project.

At the hydraulic laboratory on the Boise project studies have been made of numerous proposed types of measuring devices, and an attempt has been made to estimate rating curves for turnout gates of the ordinary type.

On the Klamath project a set of observations was made to determine the coefficients of roughness in a precast concrete flume.

A considerable quantity of field data has been accumulated in connection with the above program and it is hoped that notes can be worked up and results made available at an early date.

The bureau is cooperating with a committee of the Engineering Foundation in the preparation of a series of tests for determining the actual stresses developed in arch dams. Equipment has been purchased and plans prepared for conducting experiments of this kind at the Clear Creek Dam on the Yakima project and at the proposed Gerber dam on the Klamath project.

A series of tests was run at Bellevue, Colo., on a model of a side-channel spillway for the purpose of substantiating certain theories as to flow through structures of this type.



# APPENDIX

## LEGISLATION

### APPROPRIATION ACT

[Extracts from an act making appropriations for the Department of the Interior for the fiscal year ending June 30, 1925, and for other purposes. (Act June 5, 1924, Public No. 199, 43 Stat 390.)]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior for the fiscal year ending June 30, 1925, namely:

#### OFFICE OF THE SECRETARY

\* \* \* \* \*  
For the purchase or exchange of professional and scientific books, law books, and books to complete broken sets, periodicals, directories, and other books of reference relating to the business of the department by the several offices and bureaus of the Interior Department herein named there is hereby made available from any appropriations made for such bureau or office not to exceed the following respective sums: \* \* \* Bureau of Reclamation, \$1,500;

\* \* \* \* \*  
That the annual reports of the department and of all its bureaus and establishments, including the Bureau of Reclamation, shall not exceed a total of one thousand two hundred and fifty pages.

#### BUREAU OF INDIAN AFFAIRS

\* \* \* \* \*  
For continuing construction, maintenance, and operation of the irrigation systems on the Flathead Indian Reservation, in Montana, by and under the direction of the Commissioner of Indian Affairs, including the purchase of any necessary rights or property, \$150,000 (reimbursable).

For maintenance and operation of the irrigation systems on the Fort Peck Indian Reservation, in Montana, by and under the direction of the Commissioner of Indian Affairs, including the purchase of any necessary rights or property, \$15,000 (reimbursable).

For continuing construction, maintenance, and operation of the irrigation systems on the Blackfeet Indian Reservation in Montana, by and under the direction of the Commissioner of Indian Affairs, including the purchase of any necessary rights or property, \$20,000 (reimbursable).

\* \* \* \* \*  
For reclamation and maintenance charges on lands allotted to Paiute Indians within the Newlands project, Nevada, \$6,000; for payment of annual drainage assessments against said lands, \$2,100; in all, \$8,100, reimbursable from any funds of the said Indians now or hereafter available.

\* \* \* \* \*  
For reclamation and maintenance charges on Indian lands within the Yuma Reservation, California, and on ten acres within each of the eleven Yuma homestead entries in Arizona, under the Yuma reclamation project, \$60,000, reimbursable as provided by the Act of March 3, 1911 (Thirty-sixth Statutes at Large, page 1063).

\* \* \* \* \*  
For reimbursement to the reclamation fund the proportionate expense of operation and maintenance of the reservoirs for furnishing stored water to the lands in Yakima Indian Reservation, Washington, in accordance with the provisions of section 22 of the Act of August 1, 1914 (Thirty-eighth Statutes at Large, page 604), \$11,000.

## BUREAU OF RECLAMATION

The following sums are appropriated out of the special fund in the Treasury of the United States created by the Act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

For all expenditures authorized by the Act of June 17, 1902 (Thirty-second Statutes, page 388), and Acts amendatory thereof or supplementary thereto, known as the reclamation law and all other Acts under which expenditures from said fund are authorized, including salaries in the District of Columbia and elsewhere; examination of estimates for appropriations in the field; refunds for over-collections hereafter received on account of water-right charges, rentals, and deposits for other purposes; printing and binding, not exceeding \$30,000; purchase, maintenance, and operation of horse-drawn or motor-propelled passenger-carrying vehicles; payment of damages caused to the owners of lands or private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior; and payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior:

Salt River project, Arizona: For examination of project and project accounts, \$5,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, \$765,000, of which not to exceed \$250,000 may be expended for the construction of a hydroelectric power plant at the syphon drop on the main canal: *Provided*, That no part of said sum of \$250,000 shall be expended until contracts have been entered into by a majority of the water-right applicants and entrymen, for the lands to be charged with the cost of said hydroelectric power plant in the manner provided by section 4 of the Reclamation Extension Act approved August 13, 1914 (Thirty-eighth Statutes at Large, page 686), wherein said water-right applicants and entrymen shall agree to repay the cost of said power plant chargeable against their lands, in twelve equal annual instalments, commencing December 1, 1925;

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, \$40,000;

Grand Valley project, Colorado, including Orchard Mesa division: For operation and maintenance, continuance of construction, and incidental operations, \$465,000;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, \$150,000;

Boise project, Idaho: For operation and maintenance, continuation of construction, and incidental operations: *Provided*, That the expenditure for drainage shall not exceed the amount paid by the water users pursuant to the provisions of the Boise public notice dated February 15, 1921, except for drainage in irrigation districts formed under State laws and upon the execution of agreements for the repayment to the United States of the costs thereof, \$1,080,000: *Provided further*, That no part of the money appropriated under this paragraph shall be expended for the development of electric power until the Secretary of the Interior shall have secured, subject to the needs of the Boise project, a contract with the Gem Irrigation District, providing for the purchase by that district, for a period to be determined by the Secretary of the Interior, of the electric power necessary for the irrigation of the lands of said district: *And provided further*, That the rates in such contract shall be sufficient to include interest at five per centum per annum on the cost of such power development plus a reasonable depreciation on the power plant, as found by the Secretary of the Interior, and that the contract shall provide that before delivery of power in any season the district shall furnish security satisfactory to the Secretary of the Interior to insure payment to the Government of the power charges for such season, and that such contract shall be entered into only in the event that the holders of not less than ninety per centum of the face value of the bonded and warrant indebtedness of the district shall subordinate their claims to the obligations of the district to the Government under such contract: *And provided further*, That in the event power is furnished from the said power plant to more than one contractor, then the rates for power shall be fixed so that each such contractor, including said district, shall pay only its proper proportionate share of said interest and depreciation, as found by the Secretary of the Interior;

King Hill project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$40,000;

Minidoka project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$1,045,000: *Provided*, That no part of this appropriation (and no part of any unencumbered balance of the 1924 appropriation for the Minidoka project) shall be expended on the American Falls Reservoir until (1) all acts have been performed that are necessarily precedent to the confirmation of title in fee in the United States for said reservoir of such Indian lands as are essential to the construction of the same; (2) companies and districts which have contracted to co-operate with the United States in the construction of said reservoir and have contracted to participate in said reservoir to an aggregate amount of at least three hundred and sixty-five thousand acre-feet shall have paid to the United States their due proportionate share of all moneys expended by the United States on said reservoir prior to the date of said payments, including interest at the rate of 6 per centum per annum from the time such moneys were advanced by the United States; (3) The American Falls Reservoir district and the Empire Irrigation district shall each have filed with the Secretary of the Interior an agreement binding each of said districts to the elimination of the second paragraph of article 46 of their respective contracts of June 15, 1923, with the United States; and (4) the said companies and districts shall have paid to or deposited with the United States cash or United States Government securities amounting to a total of at least \$1,500,000: *Provided further*, That no contractor shall secure a right to the use of water from said reservoir except under a contract containing the provision that the contractor shall, as a part of the construction cost, pay interest at the rate of 6 per centum per annum upon the contractor's proper proportionate share, as found by the Secretary of the Interior, of the moneys advanced by the United States on account of the construction of said reservoir prior to the date of the contract;

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$150,000;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$315,000;

Sun River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$150,000;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$95,000;

North Platte project, Nebraska-Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$1,450,000;

Newlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, \$400,000, of which amount \$245,000 shall be used for drainage purposes, but only after execution by the Truckee-Carson irrigation district of an appropriate reimbursement contract satisfactory in form to the Secretary of the Interior, and after confirmation of such contract by decree of a court of competent jurisdiction and final decision on all appeals from such decree;

Carlsbad project, New Mexico: For operation, maintenance, and incidental operation, \$50,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, \$706,000;

Williston project (formerly North Dakota pumping project), North Dakota: For operation, maintenance, and incidental operations, \$100,000;

Baker project, Oregon: For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1924 is reappropriated and made available for the fiscal year 1925;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, \$940,000;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, \$695,000;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$185,000;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, \$40,000;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$70,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$720,000;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$650,000;

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$475,000;

Secondary projects: For cooperative and miscellaneous investigations, \$50,000;

For continued investigation of the feasibility of irrigation, water storage, and related problems on the Colorado River, and investigation of water sources of said river, \$25,000;

Under the provisions of this Act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1925, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1925 exceed the whole amount in the "reclamation fund" for that fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions, an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1925, the Commissioner of the Bureau of Reclamation shall find that the expenses of travel, including the local transportation of employees to and from their homes to the places where they are engaged on construction or operation and maintenance work, can be reduced thereby, he may authorize the payment of not to exceed three cents per mile for a motor cycle or seven cents per mile for an automobile used for necessary official business;

Total, from Reclamation fund, \$10,856,000.

## RECLAMATION PROVISIONS OF APPROPRIATION ACT FOR DEPARTMENT OF AGRICULTURE

Extracts from an act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1925, and for other purposes. (Act June 5, 1924, Public No. 201, 43 Stat. 432)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of Agriculture for the fiscal year ending June 30, 1925, namely:

\* \* \* \* \*

For investigations in connection with western irrigation agriculture, the utilization of lands reclaimed under the Reclamation Act, and other areas in the arid and semiarid regions, \$93,175;

\* \* \* \* \*

To enable the Secretary of Agriculture to encourage and aid in the agricultural development of the Government reclamation projects; to assist, through demonstrations, advice, and in other ways, settlers on the projects; and for the employment of persons and means necessary in the city of Washington and elsewhere, \$36,460.

\* \* \* \* \*

## INDIAN LANDS FOR AMERICAN FALLS RESERVOIR

An Act authorizing the acquiring of Indian lands on the Fort Hall Indian Reservation, in Idaho, for reservoir purposes in connection with the Minidoka irrigation project. (Act May 9, 1924, Public, No. 116, 43 Stat. 117)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That subject to payment being made as provided herein, there is hereby granted to the United States, its successors and assigns, for the proposed American Falls Reservoir on the Snake River under the Minidoka Federal irrigation project, in Idaho, all right, title, and interest the Indians have to the tribal and allotted lands within that section of the Fort Hall Indian Reservation commonly referred to as the Fort Hall Bottoms, which lands will be inundated by the impounding of one million seven hundred thousand acre-feet of water within said proposed reservoir, together with a five-foot freeboard the elevation of which shall be established, using as a basis the one million five

hundred thousand acre-foot contour line as shown in what is known as the Dyer-Dietz-Banks appraisal of Indian lands dated December 30, 1922, and on file in the Department of the Interior subject to the reservation of an easement to the Fort Hall Indians to use the said lands for grazing, hunting, fishing, and gathering of wood, and so forth, the same way as obtained prior to this enactment, in so far as such uses shall not interfere with the use of said lands for reservoir purposes.

SEC. 2. That the Secretary of the Interior be, and he is hereby, authorized to acquire by agreement or condemnation proceedings the area of allotted lands described in section 1. The value fixed by agreement with the allottees, and in any case where it may become necessary to institute condemnation proceedings for such purpose, the value of the allotment or allotments involved as determined by such proceedings, shall be paid out of the sum deposited to the credit of the Fort Hall Indians as provided in section 3 hereof.

SEC. 3. That in consideration of the rights granted in section 1 hereof, of both tribal and allotted lands, there shall be deposited in the Treasury of the United States to the credit of the Fort Hall Indians the total sum of \$700,000, which sum shall be taken from moneys appropriated for the construction of said reservoir: *Provided*, That the said sum of \$700,000, when so deposited, shall draw interest at the rate of 4 per centum per annum.

SEC. 4. Should any lands above the five-foot freeboard, as provided in section 1, be damaged on account of the reservoir, the amount of the damage shall be determined by a board consisting of three members—two of which shall be appointed by the Secretary of the Interior—one from the Bureau of Indian Affairs, and one from the Bureau of Reclamation, the third member, who shall be a disinterested party, to be selected by the two so appointed. The amount of damage as fixed by the board shall be taken from moneys appropriated for the construction of said reservoir and deposited in the Treasury of the United States to the credit of the Fort Hall Indians.

SEC. 5. That there is hereby authorized to be appropriated not to exceed \$100,000 of the money when deposited to the credit of the Fort Hall Tribe of Indians for use in relocating, enlarging, and reconstructing the main canal of the Fort Hall irrigation project to provide irrigation facilities for Indian lands situated in the southern portion of the Fort Hall Reservation, commonly known as the Michaud Flats, which amount so expended shall be reimbursed to the tribe by the Indians whose lands are benefitted, on a per acre basis in accordance with such rules and regulations as the Secretary of the Interior may prescribe: *Provided*, That in all cases where the Indian title becomes extinguished prior to total reimbursement of the sum assessed against any particular allotment, the party acquiring title to such allotment shall be required to execute an agreement before any water will be furnished therefor, providing for the payment of construction charges assessed against such lands, and for the payment of the annual operation and maintenance charges.

### DRAINAGE FOR INDIAN LANDS ON NEWLANDS IRRIGATION PROJECT

An Act to amend an Act entitled "An Act authorizing an appropriation to meet proportionate expenses of providing a drainage system for Piute Indian lands in the State of Nevada within the Newlands reclamation project of the Reclamation Service," approved February 14, 1923. (Act of June 7, 1924, Public No. 231, 43 Stat. 595.)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Act entitled "An Act authorizing an appropriation to meet proportionate expenses of providing a drainage system for Piute Indian lands in the State of Nevada within the Newlands reclamation project of the Reclamation Service," approved February 14, 1923, be, and the same is hereby, amended to read as follows:

"That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$49,603.05, payable in twenty annual installments of \$2,500 each, except the last, which shall be the amount remaining unpaid, for the purpose of meeting the proportionate expense of providing a drainage system for four thousand eight hundred and eighty-seven acres of Piute Indian lands in the State of Nevada within the Newlands project of the Reclamation Service.

"The money herein authorized to be appropriated shall be reimbursed in accordance with the provisions of law applicable to said Indian lands."

## INVESTIGATIONS ON THE RIO GRANDE

An Act providing for a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, in cooperation with the United States of Mexico. (Act May 13, 1924, Public No. 118, 43 Stat. 118).

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the President is hereby authorized to designate three special commissioners to cooperate with representatives of the United States of Mexico in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, with a view to their proper utilization for irrigation and other beneficial uses. One of the commissioners so appointed shall be an engineer experienced in such work. Upon completion of such study the results shall be reported to Congress.

SEC. 2. The sum of \$20,000 is hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated for carrying out the provisions hereof.

## COOPERATIVE IRRIGATION INVESTIGATIONS IN WYOMING, OREGON, AND CALIFORNIA

Joint Resolution authorizing an investigation of the proposed Casper-Alcova irrigation project, Natrona County, Wyo.; the Deschutes project in the State of Oregon, and the Southern Lassen irrigation project in Lassen County, Calif. (Senate Joint Resolution of June 7, 1924, No. 114, 43 Stat. 668)

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior be, and he is hereby, authorized and directed to prepare and submit to Congress at the beginning of the next regular session plans and estimates of the character and cost of structures necessary for the construction and completion of the proposed Casper-Alcova irrigation project in Natrona County, Wyo., the Deschutes project in the State of Oregon, and the Southern Lassen irrigation project, in Lassen County, Calif.: *Provided,* That at least one-half the cost of all such investigations, plans, and estimates shall be advanced by the State in which the project is located, or by parties interested.

## CONGRESSIONAL INVESTIGATION OF TRI-COUNTY IRRIGATION PROJECT IN NEBRASKA

Resolution authorizing the Committee on Irrigation and Reclamation to appoint a subcommittee to visit during the vacation the tri-county project in Nebraska and report to the full committee on the practicability of the same. (Senate Resolution of June 7, 1924, No. 251, 43 Stat. —)

Whereas in the Sixty-seventh Congress, a Senate joint resolution (S. J. Res. 215) was approved September 22, 1922, as follows:

*"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior, upon the payment to him in advance of the necessary funds to defray the expenses thereof, be, and he is hereby, authorized to make an additional investigation of the tri-county project in Nebraska, comprising the counties of Gosper, Phelps, and Kearney, in said State, and to extend said investigation into Adams County, Nebraska, with a view of ascertaining whether it is practicable to convey for irrigation purposes flood waters from the Platte River onto lands in said counties";

And

Whereas in accordance with such resolution a survey of said tri-county project in Nebraska has been made by the Bureau of Reclamation, and the expenses of such survey and investigation amounting to more than \$15,000 have been paid for by the State of Nebraska and the citizens living in the vicinity of said project: Now, therefore, be it

*Resolved,* That the Committee on Irrigation and Reclamation be authorized to appoint a subcommittee to visit the tri-county project in Nebraska during the recess of Congress and report to the full committee on the practicability of said project and the advisability of installing the same. There is hereby appropriated out of the contingent fund of the Senate, the sum of \$300 for the purpose of defraying the expenses of said investigation.

# FINANCIAL DATA, CONSOLIDATED AND BY PROJECTS

TABLE 1.—Consolidated financial statement, June 30, 1924

## DEBIT SIDE

<b>Primary projects:</b>			
Cost of irrigation works (Table 4)—			
Original construction .....	\$144,566,620.00		
Supplemental construction .....	6,118,157.33		
Value of works taken over .....	1,881,607.99		
Total construction cost .....		\$152,566,385.32	
Operation and maintenance prior to public notice (net) .....	2,284,671.97		
Operations and maintenance deficits and arrearages to be paid with construction .....	1,581,350.60		
		3,866,022.57	
		156,432,407.89	
<b>Less—</b>			
Abandoned works and nonreimbursable cost (net) .....	2,357,649.94		
Construction revenues .....	4,223,777.30		
Contributed funds .....	1,023,136.38		
		7,604,563.62	
Total to be repaid by water users .....			\$148,827,844.27
Operation and maintenance results (Table 9) .....			1,147,628.77
<b>Secondary projects:</b>			
Cost of investigations .....	2,135,948.49		
Less: Contributed funds .....	475,783.46		
			1,660,165.03
Plant and equipment .....			2,148,557.29
Materials and supplies .....			978,173.57
Accounts receivable:			
Current accounts due (Tables 10, 11, 12, 13, 14, 15) .....		6,358,801.99	
Deferred accounts not due .....		91,398,566.68	
			97,757,368.67
Prepaid civil service retirement fund .....			8,534.29
Unadjusted debits:			
General office expense, undistributed disbursement vouchers in transit, etc. ....			66,124.09
<b>Cash (Table 2):</b>			
Balance on hand, reclamation fund .....	5,471,646.73		
Balance on hand, Wind River Indian fund .....	303.61		
		5,471,950.33	
Collections in transit .....		23,691.97	
			5,495,642.30
<b>Total debits .....</b>			258,089,938.28

## CREDIT SIDE

<b>Security for repayment of cost of irrigation works:</b>			
Contracted construction repayments (Table 5) .....			\$111,377,795.52
<b>Accounts payable:</b>			
Contractors' earnings .....		\$69,598.18	
Labor .....		306,850.21	
Purchases .....		244,832.74	
Transportation .....		241,115.37	
Miscellaneous .....		449,040.07	
			1,311,436.57
<b>Unapplied credits:</b>			
Forfeitures, penalties, hospital, rentals from withdrawn lands, etc. ....			1,269,570.82
<b>Unadjusted credits—</b>			
Cost adjustments, collection vouchers in transit, etc. ....			165,159.75
<b>Government aid for reclamation of arid lands:</b>			
Reclamation fund (Table 3) .....		125,906,028.21	
<b>Special funds—</b>			
Judgments, Court of Claims .....		550,347.58	
Rio Grande Dam .....		1,000,000.00	
Increase of compensation (net) .....		2,759,880.98	
Wind River Indian (Riverton) .....		359,479.65	
Advances to reclamation fund (bond loan) .....	\$20,000,000.00		
Less: Amount repaid .....	4,000,000.00		
		16,000,000.00	
<b>Total .....</b>		146,574,746.42	
<b>Less: Nonreimbursable appropriation, Rio Grande Dam (Table 4) .....</b>		1,000,000.00	
		145,574,746.42	
<b>Less: Impairment of funds—</b>			
Abandoned construction works (Table 4) .....	928,181.82		
Nonreimbursable construction cost (Table 4) .....	429,468.12		
Deficits—operation and maintenance (Table 9) .....	251,120.86		
		1,608,770.80	
<b>Total credits .....</b>			143,965,975.63
			258,089,938.28

TABLE 2.—Available funds, expenditures, and balances, fiscal year 1924

	Appropriation	Reclamation fund projects		Other projects and investigations		Increase of compensation
		Reclamation fund	Wind River Indian (River-ton)	Yuma Auxiliary	General investigations	
Balance on hand July 1, 1923.....		\$4, 649, 267. 46	\$303. 61	\$76, 536. 78	\$258, 591. 76	
Proceeds from sale of public lands.....	\$705, 076. 48					
Proceeds from sale of town lots.....	5, 739. 32					
Proceeds from oil leasing act:						
Past production.....	298, 448. 16					
Current production.....	6, 395, 459. 99					
Proceeds from potassium royalties.....	3, 792. 91					
Proceeds from Federal power licenses.....	3, 048. 13					
Project collections.....	5, 743, 835. 71					
		13, 155, 400. 70				
From general treasury.....						\$288, 310. 68
From miscellaneous collections.....	9, 918. 03				19, 177. 55	
From sale of lands.....	947. 81					
From sale of water rights.....	32, 525. 62			43, 391. 46		
		17, 804, 668. 16	303. 61	119, 928. 24	277, 769. 31	288, 310. 68
<b>Expenditures:</b>						
Repayment bond loan.....	1, 000, 000. 00					
Disbursements.....	11, 333, 021. 44					
		12, 333, 021. 44		67, 637. 74	185, 782. 14	
Reclamation fund projects.....	282, 516. 49					
Yuma auxiliary project.....	1, 509. 90					
General investigations.....	4, 284. 29					288, 310. 68
Balance on hand June 30, 1924.....		5, 471, 646. 72	303. 61	52, 290. 50	91, 987. 17	



TABLE 3.—Accretions to reclamation fund, by States

States	Sales of public lands		Sales of reclamation townsites		Proceeds from oil leasing act <sup>1</sup>		Potassium royalties and rentals <sup>1</sup>	Total to June 30, 1924
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fast production	Current production		
Alabama.....						\$44,866.50		\$44,866.50
Arizona.....	\$50,455.20	\$2,143,593.84						2,143,593.84
California.....	66,133.00	7,349,372.55			\$2,393,093.70	1,858,267.64	\$19,971.55	11,630,705.44
Colorado.....	91,483.01	9,705,171.50				31,378.75		9,736,550.25
Idaho.....	59,860.43	6,694,330.19	\$1,273.11	\$177,112.18		186.11		6,873,638.48
Kansas.....	1,764.35	1,033,427.76						1,035,192.11
Louisiana.....						1,577.43		1,577.43
Montana.....	83,078.63	14,738,099.11	1,516.09	122,160.93		415,234.43		15,273,494.47
Nebraska.....	738.77	2,061,405.66						2,061,405.66
Nevada.....	18,526.77	917,020.92						917,020.92
New Mexico.....	96,302.96	5,753,448.32				4,019.11		5,757,467.43
North Dakota.....	2,248.54	12,205,005.49				9,332.12		12,214,337.61
Oklahoma.....	3,020.88	5,917,843.10						5,917,843.10
Oregon.....	38,985.00	11,643,916.17						11,643,916.17
South Dakota.....	4,338.68	7,862,249.15	300.00	74,875.92		64.20		7,757,189.27
Utah.....	67,021.19	3,608,461.85				55,647.40		3,664,109.25
Washington.....	1,255.68	7,264,277.21				7,612.19		7,271,890.40
Wyoming.....	120,394.21	7,665,586.35	2,649.52	208,010.97	2,121,620.27	11,946,895.71		21,942,083.30
Total.....	708,076.48	106,408,179.17	5,736.32	582,160.00	4,514,713.97	14,375,091.64	19,971.55	125,900,116.33
Proceeds Federal water-power licenses <sup>1</sup> .....							4,911.88	4,911.88
Grand total.....								125,905,028.21

<sup>1</sup> Totals to June 30, 1924.

Total proceeds for fiscal year 1924:

Oil leasing act, past production.....

Oil leasing act, current production.....

Potassium royalties and rentals.....

Federal water power licenses.....

Contra.

\$298,443.16

6,395,450.99

3,792.91

3,043.13

TABLE 4.—Consolidated statement by projects of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages		Construction revenues and contributed funds (contra)		Abandoned works and nonreimbursable (contra) <sup>1</sup>	Total to be repaid by water users	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924		Fiscal year 1924	To June 30, 1924
Arizona: Salt River.....		\$12,744,222.50		\$115,993.50				\$2,312,064.81	\$382,097.31		\$10,166,021.97
California: Yuma.....	\$27,994.36	8,744,889.68	\$1,167.82	373,049.15			\$90,810.84	155,969.04		\$36,637.38	8,961,996.11
California: Orland.....	\$22,890.16	1,140,496.40		\$11,729.99			\$9,974.51	14,588.56		21,914.64	1,114,177.94
Colorado: Grand Valley.....	309,605.30	4,252,231.42	\$11,450.22	117,949.06			1,852.68	55,945.08		206,272.30	4,313,325.40
Idaho: Uncompahgre.....	\$219.73	6,436,844.30	\$3,645.48	304,726.50			788.69	30,971.88	47,370.81	\$4,653.90	6,663,228.11
Idaho: American Falls.....	2,114,831.57	2,114,831.57					\$180,275.86	\$180,275.86		2,295,107.43	2,295,107.43
Idaho: Boise.....	1,299,438.24	13,713,040.47		422,192.62			12,490.02	194,581.03		1,226,948.22	13,940,632.06
Kansas: King Hill.....	7,193.50	1,892,180.14	\$6,135.61	8,532.43			1,351.26	12,906.90		\$321.37	1,887,806.67
Minnesota: Minnesota.....	\$1,738,978.60	6,592,499.36	2,314.84	153,462.60			110,880.80	1,360,811.50		\$1,847,244.75	5,391,464.41
Montana: Kansas: Garden City.....		342,963.68		52,868.10			51,176.11	61,356.82	334,474.96	\$51,176.11	
Montana: Huntley.....	3,134.94	1,498,662.51	\$107.05	\$821.59			285.36	16,990.12		2,652.53	1,482,285.44
Montana: Milk River.....	87,173.56	6,578,617.54	64,607.21	368,973.17			1,148.63	61,641.71		186,632.14	6,905,949.00
Montana: Sun River.....	170,278.57	4,840,013.06	23,165.93	114,774.61			50.84	39,864.25		193,893.76	4,417,452.36
<sup>1</sup> Abandoned works:											
Garden City.....											\$334,474.96
Hondo.....											371,867.17
Buford-Trenton.....											221,889.60
Nonreimbursable cost:											928,181.82
Salt River.....											382,097.31
Uncompahgre.....											47,370.81
Nonreimbursable appropriation:											429,408.12
Rio Grande.....											1,000,000.00
Nonreimbursable construction cost is due to repayment contracts with water users eliminating amounts specified. Nonreimbursable appropriation, 34 Stat. 1367.											
Contra.....											
\$7,823 transferred to secondary projects accounts. Actual cost for year, \$30,712.15.											
\$1,822,184.50 transferred to American Falls. Actual cost for year, \$63,207.81.											

TABLE 4.—Consolidated statement by projects of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users—Continued

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages		Construction revenues and contributed funds (contra)		Abandoned works and nonreimbursable (contra)	Total to be repaid by water users	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924		Fiscal year 1924	To June 30, 1924
Montana-North Dakota:											
Lower Yellowstone	12, 791.48	3, 165, 557.14	\$ 368.86	\$ 368.86		522, 500.05	2, 946.54	44, 669.91		9, 476.08	3, 643, 018.42
Nebraska-Wyoming:											
North Platte	1, 647, 883.93	15, 148, 630.80	168.57	406, 558.09		82, 413.95	30, 795.84	151, 698.84		1, 617, 258.66	15, 575, 908.00
Nevada-Newlands	308, 145.98	7, 454, 705.66	\$ 174.28	\$ 1, 354.51		2, 022.93	14, 293.22	172, 135.73		293, 676.48	7, 283, 238.35
New Mexico:											
Carlsbad		1, 418, 896.90	\$ 1, 190.27	\$ 11, 705.28		1, 934.00	994.19	23, 181.35		\$ 2, 184.46	1, 385, 764.27
Hondo		339, 491.66	\$ 9, 165.19	\$ 32, 916.52			\$ 9, 165.19	541.03			
New Mexico-Texas: Rio Grande	908, 013.19	13, 334, 707.64	\$ 8, 927.68	\$ 255, 185.72			1, 650.56	35, 892.96		897, 425.95	12, 043, 628.96
North Dakota:											
Bufford-Trenton		223, 423.06		\$ 31.75			25.00	1, 551.62		\$ 221, 839.69	
Williston	27, 984.18	488, 782.87		\$ 165.00		168, 471.86	\$ 445.71	10, 080.80		196, 901.45	667, 008.63
Oregon-Umatilla	676, 226.60	3, 390, 731.92				190, 627.95	1, 644.00	22, 775.17		674, 852.60	3, 648, 584.70
Oregon-California: Klamath	383, 851.83	4, 466, 870.93	1, 719.81	62, 152.27		3, 712.03	16, 405.10	177, 413.41		379, 166.54	4, 355, 291.82
South Dakota: Belle Fourche		3, 566, 124.41		\$ 1, 988.03		506, 436.99	\$ 525.00	16, 565.35		486, 569.89	4, 054, 007.02
Utah: Strawberry Valley		3, 491, 237.58		12, 111.90			8, 393.52	44, 775.00		\$ 8, 393.52	2, 458, 574.48
Washington:											
Okanogan	10, 335.16	1, 449, 548.64	1, 643.97	\$ 47, 766.87		9, 746.79	\$ 100.32	5, 708.70		12, 079.45	1, 405, 819.86
Yakima	1, 126, 738.53	13, 592, 195.02		\$ 63, 957.96		77, 262.88	9, 838.53	317, 869.62		1, 116, 854.96	13, 287, 630.32
Wyoming:											
Riverton	600, 081.75	1, 679, 969.87	\$ 111.75	\$ 111.75			1, 895.29	6, 599.86		598, 054.71	1, 673, 278.26
Shoshone	610, 474.34	8, 972, 088.36		21, 398.67		147.75	4, 388.07	77, 008.49		606, 086.27	8, 916, 626.29
Total	8, 566, 849.74	152, 566, 385.32	51, 056.12	2, 284, 671.97	653, 167.16	1, 581, 350.60	73, 686.94	5, 246, 913.68	2, 357, 649.94	9, 197, 715.35	148, 827, 844.27

\* Contra.

\* During fiscal year \$1,304.27, "O. and M. added" was canceled, and sales were made amounting to \$25, both of which reduced the value of construction works abandoned.

TABLE 5.—Consolidated statement of contracted construction repayments

State and project	Contracted repayments	
	Fiscal year 1924	To June 30, 1924
Arizona: Salt River		\$10,166,021.97
Arizona-California: Yuma	\$299,178.50	5,941,647.78
California: Orland		1,119,572.75
Colorado:		
Grand Valley		1,400,000.00
Uncompahgre		6,713,584.50
Idaho:		
American Falls	4,562,782.00	4,562,782.00
Boise	1,830,250.15	14,478,686.71
King Hill		2,000,000.00
Minidoka	1 248,294.40	6,034,519.63
Kansas: Garden City	1 51,176.11	
Montana:		
Huntley	1 6,126.10	1,314,490.15
Sun River	1 13,176.00	409,951.04
Montana-North Dakota: Lower Yellowstone	197.60	3,614,301.81
Nebraska-Wyoming: North Platte	1,063,327.50	9,999,950.58
Nevada: Newlands	149,829.00	2,588,450.01
New Mexico: Carlsbad		1,423,892.75
New Mexico-Texas: Rio Grande		7,650,000.00
North Dakota: Williston	198,471.56	489,275.30
Oregon: Umatilla	695,000.00	3,400,073.97
Oregon-California: Klamath	799,098.21	3,965,357.60
South Dakota: Belle Fourche	1,747,999.03	4,345,277.42
Utah: Strawberry Valley	7,156.33	3,091,255.70
Washington:		
Okanogan	1 739.00	1,497,840.29
Yakima	19,116.21	9,668,288.45
Wyoming: Shoshone	312,035.73	5,902,575.16
Total	11,165,272.21	4 111,377,795.52

1 Contra.

2 \$318,750 transferred to American Falls. Actual increase for year, \$70,455.60.

3 Transferred to miscellaneous revenues.

4 Contributed funds amounting to \$1,040,492.54 included in contracted repayments in fiscal year 1923 report are omitted in this table.

TABLE 6.—Consolidated statement by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results, calendar year 1923

State and project	Cost	Operation and maintenance returns				Other credits, amount to be repaid with construction	Results, excess, <sup>1</sup> and deficit
		Charges contracted	Penalties	Dis-counts (contra)	Miscellaneous revenues		
Arizona - California:							
Yuma	\$352,764.62	\$275,120.26	\$17,357.48	\$4,729.91	\$30,904.00		\$34,112.79
California: Orland	33,081.27	34,773.66	6.27	1,708.62	118.15		1 108.19
Colorado: Uncompahgre	140,494.37	158,395.50		3,181.62	780.31		1 15,499.82
Idaho:							
Boise <sup>2</sup>	344,182.32	884,736.18	20,219.58	6,208.24	13,759.28		1 68,324.48
Minidoka	122,900.00	137,375.91	6,026.86	2,640.04	5,358.44		1 23,221.17
Montana:							
Huntley	36,945.12	41,344.83	3,517.29	1,080.14	890.36		1 7,727.22
Sun River	11,469.94	10,136.61	809.90	269.87	189.24		604.06
Montana-North Dakota: Lower Yellowstone	49,868.35	49,386.03			482.32		
Nebraska-Wyoming: North Platte	202,540.07	170,443.37	1,800.27	1,091.54	1,734.75		29,653.22
Nevada: Newlands	109,358.66	107,589.62	4,544.75	4,475.10	909.27		790.12
New Mexico: Carlsbad	38,744.00	54,505.14	6,653.82	1,398.27	526.18		1 21,542.87
New Mexico-Texas: Rio Grande	193,523.53	198,345.34	1 2,864.84		345.64		1 2,302.61
North Dakota: Williston	75,500.92	1 135,572.16			45,699.97	\$168,471.56	1 3,098.45
Oregon: Umatilla	37,600.67	36,688.44	1 1,162.23	8.87	1,285.11		798.22
Oregon - California: Klamath	58,540.37	58,875.53	72.44	98.22	957.08		1 1,271.46
South Dakota: Belle Fourche	63,279.27	1 307,450.83	16,458.44	1 2,885.86	2,000.54	486,044.89	1 136,749.68
Utah: Strawberry Valley	21,428.79	94,128.43	1,230.06	1,284.86	336.27		1 72,981.11
Washington:							
Okanogan	45,558.98	53,551.25	1,733.52		888.68		1 10,614.47
Yakima	272,790.30	294,914.02	6,762.00	2,771.53	6,833.84	738.02	1 3,686.14
Wyoming: Shoshone	57,371.90	61,641.89	2,105.16	326.41	871.29		1 6,920.03
Total	2,267,943.45	1,748,929.02	85,270.86	28,382.88	114,960.72	655,254.47	1 308,069.24

1 Excess of contracted returns over net cost.

2 Includes drainage.

3 Contra.

4 Contracted charges reduced by terms of contracts with irrigation districts.

TABLE 7.—Consolidated statement by projects of operation and maintenance cost, operation and maintenance returns and other credits, and results, to December 31, 1923

State and project	Cost	Operation and maintenance returns				Other credits		Results: Excess and deficit
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits written off	Amount to be repaid with construction	
Arizona-California: Yuma	\$2,005,133.76	\$1,389,622.71	\$32,312.93	\$13,846.32	\$167,379.31		\$26.32	\$429,638.81
California: Orland	224,558.75	245,705.73	36.97	12,107.45	1,534.99			1,614.49
Colorado: Uncompahgre	140,494.37	158,395.50		3,181.62	780.31			1,16,499.82
Idaho:								
Boise 1	1,924,439.67	2,154,701.33	37,022.53	46,856.17	113,970.26			1,334,398.27
Minidoka	1,645,681.68	1,501,983.23	24,764.43	19,220.60	98,528.05		12,313.86	1,72,687.29
Montana:								
Huntley	875,466.85	465,643.42	8,633.83	7,670.49	8,492.86		1,214.64	399,152.59
Sun River	208,350.45	173,438.66	2,633.59	3,007.33	2,313.83		2,518.90	30,522.80
Montana-North Dakota: Lower Yellowstone	900,702.19	253,560.66	2,59	4.63	124,643.62		582,400.05	
Nebraska-Wyoming: North Platte	1,914,098.17	1,696,678.36	28,161.95	32,391.26	21,735.30		82,413.96	1,120,130.18
Nevada: Newlands	1,667,887.70	1,011,635.14	12,973.38	17,844.38	18,867.97		2,024.88	70,335.66
New Mexico: Carlisbad	314,171.80	502,241.38	16,563.61	7,313.45	12,711.08		1,934.00	1,11,965.29
New Mexico-Texas: Rio Grande	641,123.57	645,927.05	1,632.96	4,466.44	645.64			1,645.64
North Dakota:								
Buford-Trenton	74,731.07	2,317.41			10.00	\$71,149.39	1,304.27	
Williston	765,637.70	26,677.75	1,918.76		392,900.88	178,667.20	168,471.56	12,098.45
Oregon: Umatilla	588,429.30	368,206.29	6,347.57	3,286.43	36,504.09		190,627.95	1,9,975.27
Oregon-California: Klamath	618,008.26	618,032.45	2,730.07	4,613.42	12,404.01		3,712.03	1,13,766.86
South Dakota: Belle Fourche	1,014,749.94	563,721.89	31,963.32	9,241.55	10,691.20		506,496.99	1,86,813.91
Utah: Strawberry Valley	373,277.88	371,265.62	3,472.21	9,276.89	10,682.82			1,2,863.38
Washington:								
Okanogan	387,665.26	311,892.49	7,447.37	356.03	67,553.38		9,746.79	1,8,716.74
Yakima	2,534,236.68	2,396,564.41	37,804.26	28,714.21	88,216.92		77,307.90	1,36,942.59
Wyoming: Shoshone	657,668.10	671,149.56	9,545.73	10,112.15	14,662.31		147.75	1,27,725.09
Total	19,017,272.17	15,767,261.03	263,632.03	823,488.85	1,205,233.89	249,816.59	1,582,699.89	181,767.59

1 Excess of contracted returns over net cost.

2 Includes drainage.

TABLE 8.—Consolidated statement by projects of operation and maintenance cost, operation and maintenance returns and other credits, and results, fiscal year 1924

State and project	Cost	Operation and maintenance returns				Other credits		Results: Excess and deficit
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits written off	Amount to be repaid with construction	
Arizona-California: Yuma.....	\$397,269.80	\$347,270.34	\$19,826.33	\$6,156.49	\$45,631.13			\$81,950.76
California: Orland.....	30,889.81	34,773.66	27.95	1,709.27	28.05			1,2730.68
Colorado: Uncompahgre.....	138,695.51	157,841.45	179.25	3,312.02	2,697.38			118,710.55
Idaho:								
Boise.....	399,694.94	393,335.01	20,600.35	3,695.28	14,721.92			125,387.06
Minidoka.....	126,788.79	141,265.25	4,767.71	1,843.13	3,534.81			120,935.85
Montana:								
Huntley.....	32,349.03	40,142.83	3,397.09	855.27	948.48			111,284.10
Sun River.....	10,833.94	9,736.56	940.34	180.96	192.12			95.90
Montana-North Dakota: Lower Yellowstone.....	64,239.84	54,143.33			1,196.72			11,293.23
Nebraska-Wyoming: North Platte.....	214,228.54	195,101.11	1,090.32	933.53	2,240.18			26,328.46
Nevada: Newlands.....	118,873.03	110,824.70	4,188.87	2,108.60	858.77			5,143.45
New Mexico: Carlsbad.....	42,822.15	54,565.14	7,100.50	1,619.33	2,014.42			19,471.28
New Mexico-Texas: Rio Grande.....	216,825.18	194,783.41	1,785.62		43.64			22,074.75
North Dakota:								
Buford-Trenton.....						1,304.27	1,304.27	
Williston.....	70,374.74	113,672.07			45,407.34		108,471.56	111,532.09
Oregon: Umatilla.....	39,963.05	38,688.44	23.94	7.74	1,683.30			1,576.21
Oregon-California: Klamath.....	64,063.94	56,476.22	77.61	72.00	367.68			7,238.33
South Dakota: Belle Fourche.....	64,186.91	307,141.38	16,739.16	3,096.32	2,422.92		498,044.89	136,948.00
Utah: Strawberry Valley.....	22,770.51	18,432.60	1,129.59	1,218.76	608.36			3,818.72
Washington:								
Okanogan.....	47,410.96	52,884.75	2,633.50		1,004.62			19,113.89
Yakima.....	283,537.94	290,721.36	3,768.63	3,523.01	6,561.41		48.02	16,054.47
Wyoming: Shoshone.....	64,532.76	62,184.83	1,315.77	478.09	5,955.63			14,445.38
Total.....	2,439,476.53	1,772,346.62	88,065.99	24,642.18	44,470.18	1,304.27	653,167.16	195,265.51

! Excess of contracted returns over net cost.

! Contra.

! Includes drainage.

! Contracted charges reduced by terms of contracts with irrigation districts.

TABLE 9.—Consolidated statement by projects of operation and maintenance cost, operation and maintenance returns, and other credits and results, to June 30, 1924

State and project	Cost	Operation and maintenance returns				Other credits		Results: Excess and deficit
		Charges contracted <sup>1</sup>	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits written off	Amount to be repaid with construction	
Arizona-California: Yuma.....	\$2,220,604.76	\$1,487,550.72	\$45,018.64	\$19,459.39	\$107,950.77		\$26.32	\$619,517.70
California: Orland.....	250,119.10	245,705.73	65.72	12,108.94	1,537.49			14,919.10
Colorado: Uncompahgre.....	219,737.17	157,841.45	179.25	3,312.02	3,261.85			61,766.64
Idaho:								
Boise <sup>1</sup> .....	2,137,248.27	2,224,633.13	51,753.31	48,389.43	115,559.28			\$216,328.02
Minidoka.....	1,663,178.06	1,540,318.75	27,056.72	19,287.53	98,528.05		12,313.86	\$ 57,751.79
Montana:								
Huntley.....	891,018.73	464,305.45	10,212.35	7,798.79	9,008.21		1,214.64	414,038.87
Sun River.....	214,728.67	172,701.86	2,976.92	3,030.76	2,316.71		2,518.90	37,245.04
Montana-North Dakota: Lower Yellowstone.....	634,170.69	253,560.56	2.59	4.63	124,051.77		522,500.05	33,460.25
Nebraska-Wyoming: North Platte.....	2,011,150.28	1,977,730.49	26,702.70	32,661.83	23,210.84		82,413.95	\$ 66,345.87
Nevada: Newlands.....	1,183,380.30	1,011,324.02	15,445.64	17,993.37	19,125.97		2,022.93	163,355.11
New Mexico: Carlisbad.....	538,637.21	502,241.38	21,315.07	7,749.23	14,297.62		1,984.00	\$ 6,498.37
New Mexico-Texas: Rio Grande.....	765,791.30	645,368.91	1,428.46	4,496.44	645.64			122,836.73
North Dakota:								
Buford-Trenton.....	74,781.07	2,317.41			10.00	\$72,453.68		
Williston.....	797,309.24	26,677.75	1,918.76		415,067.84	178,667.20	168,471.56	6,476.13
Oregon-Umatilla.....	610,023.03	368,200.39	6,371.41	3,294.17	37,628.56		190,637.95	10,484.89
Oregon-California: Klamath.....	657,791.30	615,632.14	2,769.51	4,537.65	11,803.96		3,712.03	28,411.31
South Dakota: Belle Fourche.....	1,044,205.89	563,721.89	32,385.57	9,241.55	11,467.93		506,436.99	\$ 60,594.94
Utah: Strawberry Valley.....	385,538.40	370,180.62	3,918.84	9,572.85	11,121.60			9,890.19
Washington:								
Okanogan.....	411,863.92	311,225.99	8,828.10	359.03	68,079.43		9,746.79	14,344.64
Yakima.....	2,660,876.86	2,465,487.24	38,461.57	31,548.20	92,583.91		77,262.88	18,620.55
Wyoming: Shoshone.....	685,107.26	670,297.76	10,178.31	10,343.65	20,182.22		147.75	\$ 5,355.13
<b>Total.....</b>	<b>20,297,161.41</b>	<b>16,067,049.64</b>	<b>306,985.44</b>	<b>244,889.55</b>	<b>1,188,065.65</b>	<b>261,130.86</b>	<b>1,581,350.60</b>	<b>1,147,528.77</b>

<sup>1</sup> Includes charges to December 31, 1923 only.  
<sup>2</sup> Excess of contracted returns over net cost.  
<sup>3</sup> Includes drainage.

TABLE 10.—Construction repayments (including funds advanced for construction)

State and project	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924 <sup>1</sup>	
			Fiscal year 1924	To June 30, 1924		
Arizona: Salt River.....	\$809,961.32	\$1,696,922.64	\$809,961.32	\$1,696,922.64		
Arizona-California: Yuma.....	417,502.13	1,572,641.35	311,415.35	1,391,965.76	\$3,164.89	\$177,510.70
California: Orland.....	69,600.48	304,829.90	68,374.37	303,603.79		1,226.11
Colorado: Uncompahgre.....	118,237.07	264,498.37	24,915.91	54,014.79	34,832.44	175,651.14
Idaho:						
American Falls.....	33,607.00	33,607.00	33,607.00	33,607.00		
Boise.....	670,728.53	2,408,552.66	233,945.35	1,608,122.87	25,092.00	775,337.79
King Hill.....	\$ 127,416.97					
Minidoka.....	\$ 220,448.22	3,182,410.80	\$ 145,605.52	2,645,481.63	154,423.24	382,505.93
Kansas: Garden City.....	\$ 51,176.11		\$ 51,176.11			
Montana:						
Huntley.....	25,002.8	417,647.85	17,539.50	377,384.86	502.21	39,760.78
Sun River.....	6,495.62	166,852.80	7,746.60	148,646.96	213.63	17,992.21
Montana-North Dakota:	0					
Lower Yellowstone.....	28,287.38	69,422.48	6,741.12	47,876.22		21,546.26
Nebraska-Wyoming: North						
Platte.....	413,647.71	2,826,095.62	69,166.48	1,777,040.01	34,958.86	1,014,096.75
Nevada: Newlands.....	46,821.92	592,191.97	30,386.45	545,162.11	6,788.90	40,240.96
New Mexico: Carlsbad.....	57,538.92	483,415.25	69,700.37	460,148.16		23,267.09
New Mexico-Texas: Rio						
Grande.....	198,514.80	275,014.80	198,523.80	275,014.80		
Oregon: Umatilla.....	77,160.17	483,782.68	25,809.24	382,408.62		101,374.06
Oregon-California: Klamath.....	54,597.45	622,409.03	62,885.68	590,155.69		32,253.34
South Dakota: Belle Fourche.....	\$ 289,336.90	459,866.70	\$ 51,914.23	425,758.16	266.57	33,841.97
Utah: Strawberry Valley.....	133,553.90	609,899.37	83,399.85	479,796.61		130,102.76
Washington:						
Okanogan.....	10,849.35	67,044.08	9,456.77	63,738.15		3,305.93
Yakima.....	344,498.03	3,693,534.78	357,247.36	3,496,714.99	28,715.95	168,103.84
Wyoming: Shoshone.....	112,579.30	914,782.66	14,743.89	625,641.94	1,835.85	287,304.87
	3,381,692.12	21,145,422.79	2,468,081.59	17,429,205.76	290,794.54	3,425,422.49
Paid in advance of due dates.....			226,489.92	533,606.01	40,978.73	
Refunds.....			\$ 20,951.99	20,951.99		
Total.....			2,715,523.50	17,983,763.76	331,773.27	

<sup>1</sup> Other credits for fiscal year 1924; \$25,410.50. For details see project statements.<sup>2</sup> Contra.<sup>3</sup> \$33,607 transferred to American Falls. Actual accruals, \$254,055.22; actual collections, \$179,212.52.<sup>4</sup> Transferred to miscellaneous.<sup>5</sup> Account adjusted due to formation of Belle Fourche irrigation district. Actual accruals for the year, \$62,755.02; actual collections, \$2,660.24.<sup>6</sup> Prior year transactions, \$17,951.08.<sup>7</sup> Other credits to end of prior years, \$59,218.18. Applied to uncollected during fiscal year, \$18,239.45.



TABLE 11.—Operation and maintenance repayments (public notice)

State and project	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924	
			Fiscal year 1924	To June 30, 1924		
Arizona-California: Yuma.....	\$345,350.95	\$1,465,631.33	\$366,958.53	\$1,290,664.25	\$23,577.92	\$151,399.16
California: Orland.....	34,773.66	245,705.73	33,100.12	233,413.90	12,108.94	182.89
Colorado: Uncompahgre.....	157,841.45	157,841.45	82,923.36	82,923.36	5,628.57	69,289.52
Idaho:						
Boise.....	255,078.36	1,754,317.86	156,062.60	1,362,823.89	44,095.41	247,396.56
Boise (drainage).....	138,256.65	480,335.27	119,421.64	305,758.51	4,294.02	170,282.74
Minidoka.....	143,042.74	1,502,585.02	125,145.52	1,239,736.82	69,914.67	192,933.53
Montana:						
Huntley.....	30,376.57	454,536.19	37,895.86	351,811.31	8,501.96	94,225.90
Sun River.....	14,068.53	158,846.77	9,258.42	131,877.03	3,245.55	23,724.19
Montana-North Dakota:						
Lower Yellowstone.....	49,722.45	243,825.25	11,422.80	50,936.48	4.63	192,884.14
Nebraska-Wyoming: North Platte.....	185,101.11	1,977,730.49	52,188.90	1,365,211.57	42,414.25	570,104.67
Nevada: Newlands.....	108,690.33	913,689.59	87,696.85	776,648.80	28,277.55	108,763.24
New Mexico: Carlsbad.....	54,505.14	502,241.38	78,758.73	470,139.33	7,749.23	24,352.82
New Mexico-Texas: Rio Grande.....	208,234.00	597,312.40	201,102.44	585,694.40	4,486.44	7,131.56
North Dakota:						
Buford-Trenton.....		2,317.41		2,317.41		
Williston.....	145,242.55	26,677.75		26,677.75		
Oregon: Umatilla.....	42,522.54	322,383.73	38,955.57	283,869.56	3,294.17	35,220.01
Oregon-California: Klamath.....	56,062.97	548,969.89	77,797.19	489,228.65	30,131.60	29,609.64
South Dakota: Belle Fourche.....	1345,290.44	525,572.83	52,919.53	460,570.52	9,376.82	55,625.49
Utah: Strawberry Valley.....	42,086.27	319,223.46	31,578.51	272,564.78	9,572.85	37,065.83
Washington:						
Okanogan.....	62,555.97	283,523.50	49,774.14	264,408.47	2,614.61	16,500.42
Yakima.....	260,721.36	2,465,487.24	230,478.53	2,288,257.55	32,593.63	144,636.06
Wyoming: Shoshone.....	62,184.83	670,297.76	16,330.66	421,391.31	18,597.12	230,309.33
Total.....	1,842,505.83	15,619,055.30	1,731,055.24	12,750,925.64	360,479.96	2,501,649.70
Paid in advance of due dates.....			41,269.43	60,457.85	806.06	
Penalties and interest.....			70,878.85	286,032.75	19,002.44	1,940.25
Refunds.....			12,750.02	12,750.02		
Total cash collections.....			1,855,953.54	13,116,166.26		

1 Contra.

2 \$25,066.72 transferred to miscellaneous collections. Actual collections for year, \$13,643.92.

3 Accounts adjusted owing to formation of Belle Fourche irrigation district. Actual accruals for year, \$89,573.46; actual collections, \$943.45.

4 Other credits for fiscal year 1924, \$33,449.95. For details see project statements.

5 Other credits for fiscal year 1924, \$742.88. For details see project statements.

6 Other credits for fiscal year 1924, \$15,266.89. For details see project statements.

7 Prior year transactions except \$823.56.

TABLE 12.—*Rentals of irrigation water*

State and project	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924 <sup>1</sup>	
			Fiscal year 1924	To June 30, 1924		
Arizona: Salt River.....		\$2,246,726.01		\$2,246,726.01		
Arizona-California: Yuma.....	\$51,694.11	444,298.73	\$50,649.48	440,199.29	\$292.01	\$3,807.43
California: Orland.....		120,384.00		120,384.00		
Colorado:						
Grand Valley.....	55,649.75	275,479.09	60,026.58	244,528.71	4,000.14	26,950.24
Uncompahgre.....	6,338.05	1,189,114.15	17,677.04	1,154,265.50	12,090.44	22,758.15
Idaho:						
Boise.....	14,278.57	754,293.75	8,840.40	731,007.61	4,720.50	18,565.64
King Hill.....	36,138.21	88,368.91	1,146.46	50,515.83		37,853.11
Minidoka.....	1,219.97	272,023.33	1,355.90	268,657.43	3,234.23	131.67
Montana:						
Huntley.....	896.37	7,236.73	638.20	6,770.64		466.09
Milk River.....	15,953.38	192,059.66	20,013.37	172,161.63	1,015.68	18,882.35
Sun River.....	4,309.29	52,554.17	4,750.93	25,872.23	539.74	26,142.20
Montana-North Dakota:						
Lower Yellowstone.....	322.31	123,587.99	199.08	122,068.26		1,519.73
Nebraska-Wyoming: North Platte.....	53,741.65	222,583.37	40,340.83	208,596.44	10.00	13,976.93
Nevada: Newlands.....	2,425.05	19,361.27	642.20	17,558.92	1,761.85	40.50
New Mexico:						
Carlsbad.....	2,691.32	21,933.01	2,691.32	21,933.01		
Hondo.....		9,165.19		9,129.70		35.49
New Mexico-Texas: Rio Grande.....	8,927.68	1,118,403.12	5,369.05	1,080,816.31		37,586.81
North Dakota:						
Buford-Trenton.....		31.75		31.75		
Williston.....		2,117.28		2,117.28		
Oregon: Umatilla.....	1,207.80	33,308.04	1,207.80	33,308.04		
Oregon-California: Klamath.....	967.68	43,981.31	1,254.60	43,792.43		188.88
South Dakota: Belle Fourche.....	304.72	5,364.82	286.92	5,197.02	17.80	150.00
Utah: Strawberry Valley.....	175.25	8,563.64	175.25	8,563.64		
Washington:						
Okanogan.....	1,206.37	109,244.48		106,222.69	2,584.19	437.60
Yakima.....	3,296.76	143,835.72	2,771.31	142,745.44		1,140.28
Wyoming:						
Riverton.....	111.75	111.75	111.75	111.75		
Shoshone.....	5,282.47	17,648.52	5,394.57	17,508.47		140.05
Total.....	161,337.65	7,521,829.82	124,244.08	7,280,790.09	30,266.58	210,773.15

<sup>1</sup> Other credits for fiscal year 1924, \$6,457.53. For details see project statements.<sup>2</sup> Contra.TABLE 13.—*Rentals of power and light*

State and project	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924	
			Fiscal year 1924	To June 30, 1924		
Arizona: Salt River		\$998,411.03		\$998,411.03		
Idaho:						
Boise	\$10,890.11	128,169.91		96,424.61	\$31,745.30	
Minidoka	107,275.49	799,046.79	\$107,047.69	770,820.27	4,818.42	\$22,408.10
Nebraska-Wyoming: North Platte	30,255.10	113,864.58	29,187.79	97,260.43	14,255.59	2,348.56
Nevada: Newlands	18,476.81	202,837.37	18,646.66	176,159.07	25,505.75	1,172.55
New Mexico-Texas: Rio Grande		2,243.33		2,243.33		
North Dakota: Williston	44,288.70	409,986.20	44,547.00	406,680.00		3,256.20
Oregon-California: Klamath	537.65	7,697.18	537.65	7,697.18		
Utah: Strawberry Valley	24,480.76	151,509.65	24,751.30	149,961.72		1,547.93
Washington:						
Okanogan		1,754.71		1,754.71		
Yakima		3,635.33		3,635.33		
Wyoming: Shoshone	8,114.63	14,637.34	7,944.24	13,969.44		667.90
Total	243,223.95	2,833,743.42	231,587.03	2,725,017.12	76,325.06	32,401.24

<sup>1</sup> For explanation of reduction see project data. <sup>2</sup> Contra. <sup>3</sup> Other credits for fiscal year, \$12,776.74.

TABLE 14.—Rentals of grazing and farming lands

State and project	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924	
			Fiscal year 1924	To June 30, 1924		
Arizona: Salt River		\$19,373.14		\$19,373.14		
Arizona-California: Yuma	\$2,000.92	13,857.02	\$2,032.92	13,703.85		\$153.17
California: Orland	47.50	79.50	47.50	79.50		
Colorado:						
Grand Valley	50.00	279.00	50.00	217.00		62.00
Uncompagbre	45.45	197.45	45.45	197.45		
Idaho:						
Boise	520.41	20,668.20	520.41	20,579.50		88.70
Minidoka	749.29	34,372.16	840.42	30,207.93		4,164.23
Montana:						
Huntley	478.56	12,674.22	583.14	12,243.13		431.09
Milk River	3,774.63	30,914.31	3,758.20	30,490.69	\$38.88	384.77
Sun River	2,792.02	34,124.83	4,088.96	30,814.10		3,310.73
Montana - North Dakota:						
Lower Yellowstone	134.33	3,108.95	140.33	3,003.95		105.00
Nebraska-Wyoming: North						
Platte	2,393.16	83,070.08	3,121.52	77,556.38		5,513.70
Nevada: Newlands	5,041.78	29,626.40	3,571.28	27,709.90		1,916.50
New Mexico: Carlsbad	1,470.31	13,166.24	1,470.31	12,631.80		534.44
New Mexico-Texas: Rio						
Grande	151.50	1,951.70	166.50	1,951.70		
North Dakota:						
Buford-Trenton		423.93		423.93		
Williston		249.98		249.98		
Oregon: Umatilla	522.05	2,101.55	522.05	2,051.55		50.00
Oregon-California: Klamath	18,358.99	176,765.15	18,182.99	176,145.15	84.00	536.00
South Dakota: Belle Fourche	323.17	641.94	319.17	637.94		4.00
Utah: Strawberry Valley	15,499.20	151,290.36	15,499.20	151,290.36		
Washington:						
Okanogan	50.00	772.50	50.00	772.50		409.20
Yakima	1,781.46	23,061.50	1,617.56	22,652.30		210.00
Wyoming: Shoshone	1,121.27	9,589.61	1,272.27	9,379.61		210.00
Secondary projects	9,004.82	163,026.99	9,472.58	119,538.35	42,497.67	990.97
Total	66,310.82	825,376.74	67,372.76	763,991.69	42,620.55	18,864.50

<sup>1</sup> Other credits for fiscal year, \$102.

TABLE 15.—Statement of miscellaneous balances due and unpaid (not including construction and operation and maintenance repayments, water rentals, rentals of power and light, and grazing and farm land rentals)

State and project	Amount	State and project	Amount
Arizona-California: Yuma	\$1,558.03	New Mexico-Texas: Rio Grande	\$13,829.12
Colorado:		North Dakota: Williston	7.65
Grand Valley	330.75	Oregon: Umatilla	627.77
Uncompahgre	149.68	Oregon-California: Klamath	5,054.31
Idaho:		South Dakota: Belle Fourche	4,311.90
American Falls	234.61	Utah: Strawberry Valley	87.13
Boise	2,555.88	Washington:	
King Hill	156.89	Okanogan	1,385.65
Minidoka	22.50	Yakima	1,643.11
Montana:		Wyoming:	
Huntley	63.25	Riverton	1,462.43
Milk River	1,841.97	Shoshone	39,192.94
Sun River	1,602.29	Secondary projects	33,051.51
Montana-North Dakota: Lower Yellowstone	7.70	Washington office	22,208.02
Nebraska-Wyoming: North Platte	9,250.49	Denver office	22,845.06
Nevada: Newlands	628.09	Field legal	4,060.30
New Mexico: Carlsbad	171.73	Total	167,740.66

TABLE 16.—Voucher transactions, all funds, and net investment, as of June 30, 1924, reclamation fund projects

State and project	Expenditures <sup>1</sup>		Collections <sup>2</sup>		Net investment	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Arizona: Salt River.....		\$14, 671, 484. 24	\$839, 206. 87	\$5, 880, 699. 73	\$839, 206. 87	\$8, 790, 784. 51
Arizona-California:						
Yuma.....	\$453, 934. 35	12, 526, 016. 84	758, 885. 33	3, 788, 528. 90	\$ 304, 950. 98	8, 737, 487. 94
California: Orland.....	56, 616. 94	1, 535, 109. 74	104, 502. 12	704, 004. 72	\$ 47, 885. 18	831, 105. 02
Colorado:						
Grand Valley.....	386, 589. 76	4, 837, 743. 20	73, 356. 45	382, 459. 89	313, 233. 31	4, 455, 283. 31
Uncompahgre.....	132, 945. 33	8, 265, 504. 16	129, 137. 66	1, 527, 752. 38	3, 807. 67	6, 737, 751. 78
Idaho:						
Boise.....	1, 428, 502. 91	17, 411, 941. 33	611, 186. 99	4, 848, 318. 84	815, 315. 92	12, 563, 622. 40
King Hill.....	54, 711. 58	2, 043, 235. 47	9, 798. 55	113, 208. 81	44, 913. 03	1, 929, 938. 66
Minidoka.....	\$ 1, 107, 649. 29	8, 793, 041. 84	162, 174. 25	5, 287, 138. 06	\$ 1, 269, 823. 54	3, 505, 905. 78
American Falls Reservoir.....	\$ 2, 102, 586. 00	2, 102, 586. 00	510, 833. 66	510, 833. 66	1, 591, 752. 34	1, 591, 752. 34
Kansas: Garden City.....		390, 495. 54		58, 002. 27		332, 493. 27
Montana:						
Huntley.....	30, 695. 86	2, 451, 575. 90	62, 038. 24	824, 909. 47	\$ 31, 342. 38	1, 626, 666. 43
Milk River.....	117, 737. 43	7, 339, 569. 45	37, 930. 07	385, 275. 10	79, 807. 36	6, 954, 294. 35
Sun River.....	191, 041. 00	4, 841, 053. 70	32, 280. 41	465, 916. 41	158, 760. 59	4, 375, 137. 29
Montana-North Dakota:						
Lower Yellowstone.....	88, 889. 31	4, 129, 107. 93	22, 558. 18	322, 083. 67	66, 331. 13	3, 807, 024. 26
Nebraska-Wyoming:						
North Platte.....	1, 866, 931. 98	18, 358, 735. 82	248, 889. 15	3, 931, 305. 09	1, 618, 042. 83	14, 427, 430. 73
Nevada: Newlands.....	389, 197. 61	8, 932, 851. 35	152, 254. 12	1, 761, 359. 32	236, 943. 49	7, 171, 492. 03
New Mexico:						
Carlsbad.....	40, 875. 28	1, 991, 625. 35	166, 343. 92	1, 055, 814. 87	\$ 125, 468. 64	935, 810. 48
Hondo.....		406, 744. 36		34, 841. 70		371, 902. 66
New Mexico-Texas: Rio Grande.....	1, 044, 519. 40	15, 654, 277. 02	436, 400. 92	2, 553, 592. 76	608, 118. 48	13, 100, 684. 26
North Dakota:						
Buford-Trenton.....		311, 229. 60	25. 00	17, 457. 93	\$ 25. 00	293, 771. 67
Williston.....	90, 116. 36	1, 310, 740. 55	45, 526. 59	457, 976. 62	53, 589. 77	852, 763. 93
Oregon: Umatilla.....	933, 226. 27	4, 339, 123. 27	86, 088. 18	910, 352. 79	847, 138. 09	3, 428, 770. 48
Oregon-California:						
Klamath.....	418, 858. 01	5, 296, 062. 66	167, 548. 40	1, 392, 048. 08	251, 309. 61	3, 904, 014. 58
South Dakota: Belle Fourche.....	59, 855. 03	4, 673, 434. 05	5, 987. 99	1, 064, 471. 75	53, 867. 04	3, 588, 962. 30
Utah: Strawberry Valley.....	40, 066. 15	4, 226, 796. 77	160, 238. 76	1, 286, 556. 51	\$ 120, 182. 61	2, 938, 237. 26
Washington:						
Okanogan.....	54, 667. 49	1, 883, 300. 74	64, 162. 74	488, 293. 31	\$ 9, 495. 25	1, 395, 007. 43
Yakima.....	1, 264, 099. 35	16, 761, 551. 14	656, 303. 86	6, 674, 865. 09	607, 795. 49	10, 086, 686. 06
Wyoming:						
Riverton.....	760, 243. 76	2, 091, 940. 77	6, 349. 45	33, 828. 47	753, 894. 31	2, 068, 112. 30
Shoshone.....	477, 040. 42	9, 962, 650. 39	55, 253. 35	1, 327, 018. 27	421, 787. 07	8, 635, 632. 12
Secondary (including Deschutes and Baker):						
Denver office (net not transferred to projects) <sup>3</sup>	45, 686. 26	247, 591. 47	38, 989. 24	165, 438. 65	6, 666. 02	82, 152. 82
Field legal (net not transferred to projects) <sup>4</sup>	2, 350. 38	13, 490. 61	3, 462. 28	6, 073. 17	\$ 1, 111. 90	7, 417. 44
Washington office (net not transferred to projects) <sup>5</sup>	37, 442. 26	395, 138. 80	31, 157. 91	318, 860. 82	6, 284. 35	76, 277. 96
Indian projects <sup>6</sup>		2, 997, 829. 24		2, 997, 829. 24		
Civil service retirement fund (unabsorbed) <sup>7</sup>	2, 532. 56	8, 534. 29			2, 532. 56	8, 534. 29
General investigations <sup>8</sup>	5, 120. 16	5, 120. 16	25, 500. 00	25, 500. 00	\$ 20, 379. 84	\$ 20, 379. 84
Total.....	11, 614, 552. 28	193, 341, 009. 50	5, 742, 850. 06	52, 238, 213. 41	5, 871, 702. 22	141, 102, 796. 09

<sup>1</sup> Expenditures from reclamation fund, increase of compensation, judgments, Court of Claims, Rio Grande Dam appropriation and Wind River Indian (Riverton). Amounts given for each project include net transfers (transfers from other projects less transfers to other projects).

<sup>2</sup> Collections creditable to increase of compensation, Rio Grande Dam appropriation and Wind River, Indian (Riverton) are included in the expenditure column as contra.

<sup>3</sup> Contra.

<sup>4</sup> Investment for American Falls Reservoir project separated from Minidoka project investment in November, 1923.

<sup>5</sup> See following analysis

<sup>6</sup> Expended for Bureau of Indian Affairs from reclamation fund and later reimbursed by Congressional appropriation.

<sup>7</sup> Analysis of civil service retirement fund:

Transferred from reclamation fund to civil service retirement fund..... \$96, 785. 00

Deducted from pay of employees..... 88, 250. 71

Unabsorbed balance..... 8, 534. 29

<sup>8</sup> See explanation under "Financial data for expenditures from appropriation" General investigations, Reclamation Service, 1923, Dec. 31, 1924.

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TABLE 16.—*Voucher transactions, all funds, and net investment, as of June 30, 1924, reclamation fund projects—Continued*

## ANALYSIS OF EXPENDITURES AND INVESTMENTS BY FUNDS

Item	Expenditures		Collections		Net investment	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Reclamation fund.....	\$11,333,021.44	\$188,671,504.90	\$5,743,835.71	\$52,238,213.41	\$5,689,185.73	\$136,433,381.40
Increase of compensation (net) <sup>1</sup> .....	282,516.49	2,759,890.98	-----	-----	282,516.49	2,759,890.98
Judgments, Court of Claims.....	-----	550,347.58	-----	-----	-----	550,347.58
Rio Grande Dam appropriation (net).....	-----	1,000,000.00	-----	-----	-----	1,000,000.00
Wind River Indian (Riverton) (net).....	<sup>1</sup> 985.65	359,176.04	<sup>1</sup> 985.65	-----	-----	359,176.04
Total.....	11,614,552.28	193,341,009.50	5,742,850.06	52,238,213.41	5,871,702.22	141,102,796.09

Item	Denver		Field legal		Washington	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Reclamation fund disbursements.....	\$207,566.41	\$1,511,009.63	\$52,973.63	\$536,480.36	\$229,092.56	\$5,191,301.16
Increase of compensation (net).....	<sup>1</sup> 1,245.58	<sup>1</sup> 1,261.00	17.75	249.81	7,204.87	1,930.87
Total.....	206,320.83	1,510,348.63	52,991.38	536,730.17	236,297.43	5,193,232.03
Less:						
Net transfers.....	160,635.57	1,262,757.16	50,641.00	523,239.56	198,855.17	4,798,093.23
Collections.....	38,989.24	165,438.65	3,462.28	6,073.17	31,157.91	318,860.82
Total.....	199,624.81	1,428,195.81	54,103.28	529,312.73	230,013.08	5,116,954.05
Net investment.....	6,696.02	82,152.82	<sup>1</sup> 1,111.90	7,417.44	6,284.35	76,277.98

<sup>1</sup> Contra.

<sup>2</sup> Includes \$17,761.73 increase of compensation, Wind River Indian (Riverton).

NOTE.—Denver Washington and field legal offices' investment represents under or over distributed expenditures to projects analyzed as follows:

TABLE 17.—*Voucher transactions and net investment as of June 30, 1924, other than reclamation fund projects*

Item	Expenditures		Collections		Net investment	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Yuma auxiliary project fund.....	\$67,637.74	\$743,226.17	\$43,391.46	\$795,516.67	\$24,246.28	<sup>1</sup> \$52,290.60
Increase of compensation fund (net).....	1,509.90	15,851.45	-----	-----	1,509.90	15,851.45
Total.....	69,147.64	759,077.62	43,391.46	795,516.67	25,756.18	<sup>1</sup> 36,439.05
Drainage and cut-over fund.....	-----	100,279.59	-----	464.51	-----	99,815.08
Increase of compensation fund (net).....	-----	728.94	-----	-----	-----	728.94
Total.....	-----	101,008.53	-----	464.51	-----	100,544.02
General investigations, Reclamation Service, 1923-Dec. 31, 1924, fund.....	185,782.14	202,190.38	19,177.55	19,177.55	166,604.59	183,012.83
Increase of compensation fund (net).....	4,284.29	4,589.10	-----	-----	4,284.29	4,589.10
Total.....	190,066.43	206,779.48	19,177.55	19,177.55	170,888.88	187,601.93

<sup>1</sup> Contra.

TABLE 18.—Appropriations by projects for the fiscal year 1924 showing increases and decreases authorized, liabilities and expenditures and balances (to lapse) unencumbered

State	Project	Appropriation act	10 per cent increases and decreases	Contributed funds not spent previous years	Increase of compensation (net)	Miscellaneous collections and transfers	Total authorized	Expenditures	Balance unexpended	Liabilities	Balance unencumbered (to lapse) <sup>1</sup>
Arizona	Salt River	\$5,000.00			\$13,918.50	\$151,094.98	\$5,000.00		\$5,000.00		\$5,000.00
Arizona-California	Yuma	430,000.00			3,101.32	3,073.77	565,015.48	\$412,000.26	183,005.22		132,005.72
California	Orland	50,000.00	\$5,000.00		6,087.63	73,710.34	61,175.09	46,500.00	12,670.09	\$51,000.50	101,501.60
Colorado	Grand Valley	295,000.00			9,536.28	22,305.19	178,341.47	312,531.58	162,298.30	29,396.53	132,899.87
Do.	Uncampaiago	185,000.00	\$18,500.00		14,180.50	608,690.00	1,058,370.50	198,341.47	74,448.16	7,961.82	162,484.84
Idaho	American Falls	435,500.00			26,798.70	104,967.57	1,521,763.36	204,666.03	763,703.06	301,343.57	462,860.80
Do.	Rose Hill	1,300,000.00			2,308.73	15,425.92	52,732.65	1,081,926.08	439,837.28	45,066.16	394,771.12
Do.	King Hill	225,500.00			1,569.25		231,069.25	44,518.99	8,213.66	33,142.81	7,807.19
Do.	Mindoka	115,000.00	\$11,500.00		1,514.85	4,301.80	109,406.71	27,816.20	81,590.54	3,516.18	78,074.36
Montana	Milk River	140,000.00			4,332.88	49,257.80	185,590.08	106,146.82	89,441.86	5,366.66	84,075.17
Do.	Sun River	145,000.00			5,641.38	32,742.31	182,388.68	111,624.36	70,765.53	7,351.34	63,414.19
Do.	Lower Yellowstone	120,000.00	\$12,000.00		2,364.31	9,978.72	120,563.03	61,778.69	58,783.34	6,791.15	52,992.19
Dakota	stone	1,420,000.00			28,031.07	142,299.09	1,732,331.06	1,422,734.47	309,596.69	303,184.89	6,411.70
Nebraska-Wyoming	North Platte	735,000.00	\$73,500.00		9,382.08	30,047.44	700,930.12	312,686.32	388,234.80	36,500.54	351,734.26
Nevada	Newlands	80,000.00	\$8,000.00		2,807.98	11,539.86	86,347.84	40,365.23	45,982.61	1,131.84	44,850.77
New Mexico	Carlsbad	90,000.00	\$9,000.00		35,871.71	55,606.36	1,042,478.07	908,670.90	133,807.17	92,124.07	41,683.10
New Mexico-Texas	Williston	100,000.00			2,553.14	46,054.26	148,607.40	94,376.91	54,230.49	6,292.21	48,938.28
North Dakota	Umatilla	100,000.00	70,000.00		9,960.14	25,867.29	1,005,827.43	736,528.66	269,298.57	199,382.43	69,916.14
Oregon	Klamath	700,000.00			8,868.66	26,875.92	735,742.58	345,528.83	390,213.75	246,932.66	143,281.09
Oregon-California	Belle Fourche	95,000.00	\$9,500.00		3,540.92	3,260.09	92,301.01	51,318.04	40,987.97	5,930.33	35,057.64
South Dakota	Strawberry Valley	45,000.00			3,097.87	44,760.18	92,858.05	37,920.23	54,937.82	1,426.33	53,512.31
Utah	Okanogan	65,000.00			3,067.87	2,209.96	69,814.56	51,364.69	18,449.87	6,420.31	13,029.56
Do.	Yakima	1,310,000.00	\$102,500.00		28,557.80	76,931.38	1,312,989.18	1,081,432.34	251,556.84	205,159.94	46,396.90
Wyoming	Riverton	600,000.00	60,000.00		9,894.08	9,159.48	679,053.66	621,353.36	57,700.20	54,944.07	2,756.13
Do.	Shoshone	925,000.00	\$92,500.00		14,465.01	49,475.74	806,440.75	399,285.77	497,154.98	48,328.44	448,826.54
Secondary:											
	Baker	500,000.00			83.42	310.90	500,394.32	4,459.28	495,935.04		495,935.04
	Others	200,000.00			5,941.41	64,819.40	292,473.22	128,628.57	163,844.65	4,943.82	158,900.83
		12,250,000.00		21,712.41	258,235.01	1,664,857.93	14,194,805.35	9,083,759.72	5,161,045.63	1,703,221.19	3,467,824.44

<sup>1</sup> Except Baker, all of which is carried over to fiscal year 1925, and American Falls which carries forward \$375,000 (contributed funds). Cash on hand with United States Treasurer and special fiscal agents \$5,471,950.33, Table No. 1.<sup>2</sup> Contra.

# 114 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

## SALT RIVER PROJECT, ARIZONA

<b>Appropriations:</b>	
Fiscal year 1924, amount of congressional authorizations.....	\$5,000
Unencumbered balance, June 30, 1924.....	5,000
Fiscal year 1925, amount specified in appropriation act.....	5,000
<b>To June 30, 1924:</b>	
<b>Irrigation works—</b>	
Original construction.....	\$11,292,362.55
Value of works taken over.....	1,451,860.04
Total construction cost <sup>1</sup> .....	12,744,222.59
Operation and maintenance prior to public notice (net).....	115,993.50
	\$12,860,216.09
<b>Less—</b>	
Construction revenues.....	2,312,096.81
Non reimbursable cost.....	382,097.31
	2,694,194.12
To be repaid by water users.....	10,166,021.97
<b>Repayments—</b>	
Contract, Salt River Valley Water Users' Association.....	10,166,021.97
<b><sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....</b>	
Plus miscellaneous revenues to June 30, 1923.....	\$2,312,096.81
Less operation and maintenance prior to public notice, June 30, 1923 (net)....	115,993.50
	2,196,103.31
Construction cost to June 30, 1923.....	12,744,222.59

## Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$14,662,033.96	\$9,450.28	\$14,671,484.24
Less collections.....	5,880,699.73		5,880,699.73
Net investment June 30, 1924.....	8,781,334.23	9,450.28	8,790,784.51

## Status of current accounts receivable June 30, 1924

	Due		Collected	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
<b>Construction:</b>				
Water-right charges.....	\$809,961.32	\$1,696,922.64	\$809,961.32	\$1,696,922.64
Charges paid in advance.....			5,780.84	10,633.34
<b>Revenues:</b>				
Rentals of irrigation water.....		2,246,726.01		2,246,726.01
Rentals of power and light.....		998,411.03		998,411.03
Rentals of grazing and farming lands.....		19,373.14		19,373.14
Subtotal.....		3,264,510.18		3,264,510.18
Miscellaneous collections.....			23,464.71	908,631.57
Grand total collections.....			839,206.87	5,880,699.73

## YUMA PROJECT, ARIZONA-CALIFORNIA

<b>Appropriations:</b>	
<b>Fiscal year 1924—</b>	
Congressional authorizations.....	\$595,015.46
Disbursements.....	\$412,006.26
Liabilities outstanding.....	51,000.50
	463,006.76
Unencumbered balance June 30, 1924.....	132,006.72
<b>Fiscal year 1925—</b>	
Amount specified in appropriation act.....	765,000.00

*Investment*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$12,368,465.97	\$157,550.87	\$12,526,016.84
Less collections.....	3,788,528.90		3,788,528.90
Net investment June 30, 1924.....	8,579,937.07	157,550.87	8,737,487.94

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction <sup>1</sup> .....	\$27,994.36	\$8,744,889.68
Operation and maintenance prior to public notice (net) <sup>2</sup> .....	1,167.82	373,049.15
Operation and maintenance arrearages being repaid with construction.....		26.32
		\$9,117,965.15
<b>Less—</b>		
Contributed funds.....		101,113.89
Construction revenues.....	<sup>2</sup> 9,810.84	54,855.15
		155,969.04
To be repaid by water users.....	36,637.38	8,961,996.11
Repayment—		
Water-right contracts (individual).....	299,178.50	5,941,647.78

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$9,026,572.84
Plus miscellaneous revenues, June 30, 1923.....	\$64,665.99
Less operation and maintenance deficits and arrearages June 30, 1923.....	\$28.32
Cost adjustments and undistributed clearing June 30, 1923.....	100.22
Operation and maintenance prior to public notice June 30, 1923 (net) <sup>2</sup> .....	374,216.97
	374,343.51
	309,677.52

Construction cost to June 30, 1923.....	8,716,895.32
Cost, fiscal year 1924.....	27,994.36
Construction cost to June 30, 1924.....	8,744,889.68
<sup>2</sup> Contra.....	

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$352,764.62	\$2,006,133.76	\$397,259.80	\$2,220,604.76
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	275,120.26	1,899,622.71	347,270.34	1,467,550.72
Penalties.....	17,357.48	32,312.93	19,826.33	45,018.64
Discounts (contra).....	4,729.91	13,846.32	6,156.49	19,459.39
Miscellaneous revenues.....	30,904.00	167,379.31	<sup>2</sup> 45,631.13	107,950.77
Subtotal.....	318,651.83	1,575,468.63	315,309.05	1,601,080.74
<b>Other credits:</b>				
Operation and maintenance arrearages being repaid with construction.....		26.32		26.32
Total.....	318,651.83	1,575,494.95	315,309.05	1,601,087.06
Result, deficit:.....	34,112.79	429,638.81	81,950.75	619,517.70



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Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction: Water-right charges.....	\$417,502.13	\$1,471,527.46	\$311,415.35	\$1,290,851.87	\$2,012.32	\$3,164.89	\$177,510.70
Contributed funds.....		101,113.89		101,113.89			
Total.....	417,502.13	1,572,641.35	311,415.35	1,391,965.76	2,012.32	3,164.89	177,510.70
Charges paid in advance.....			13,435.55	7,766.67		146.81	
Operation and maintenance: Water-right charges, project lands (63,084 acres).....	345,350.95	1,465,631.33	366,958.53	1,290,664.25	6,262.55	23,577.92	151,899.16
Penalties and interest.....			19,816.07	44,718.09	10.26	300.55	
Charges paid in advance.....			12,477.40	1,473.83	499.85	559.20	
Revenues: Rentals of irrigating water.....	151,694.11	444,298.73	150,649.48	440,199.29		292.01	3,807.43
Rentals of grazing and farming lands.....	2,000.92	13,857.02	2,032.92	13,703.85			153.17
Subtotal.....	149,693.19	458,155.75	148,616.56	453,903.14		292.01	3,960.60
Miscellaneous uncollected.....							1,568.03
Other collections (reclamation fund): Construction forfeitures.....			727.42	3,179.94			
Construction penalties.....			54,127.43	91,109.77			
Construction refunds.....				1,583.60			
Operation and maintenance refunds.....				243.91			
Miscellaneous.....			60,370.04	501,914.94			
Grant total collections.....			758,885.33	3,788,528.90			

<sup>1</sup> Contra.

<sup>2</sup> Reduction due to transfer to operation and maintenance account. Uncollected construction water-right charges as of June 30, 1924, 12 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1924, 10.3 per cent of total accruals.

## YUMA AUXILIARY

Appropriations: All funds advanced by purchasers of lands and water rights.

Irrigation works	Fiscal year 1924	To June 30, 1924
Construction cost, original.....	\$53,668.01	\$634,890.10
To return construction cost:		
Water-right contracts.....	1108,220.00	936,466.00
Land-purchase contracts.....	115,613.95	129,099.53
Water-right contract forfeitures.....	4,452.00	8,822.00
Water-right contract interest.....	1,132.90	31,329.39
Land-purchase contract forfeitures.....	797.75	1,595.75
Land-purchase contract interest.....	230.45	4,145.16
Miscellaneous revenues.....	1222.77	1,034.97
Total.....	1117,413.63	1,112,501.71

<sup>1</sup> Contra.

## YUMA AUXILIARY—continued

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost, original.....	\$51,030.20	\$66,625.05	\$47,363.41	\$88,647.89
To return operation and maintenance cost:				
Contracted.....	52,519.61	69,750.04	59,761.88	119,723.36
Interest.....	431.27	451.99	402.34	537.74
Discounts (contra).....	933.02	1,110.29	69.84	1,106.79
Miscellaneous revenue.....	75.00	75.00	75.00	150.00
Total.....	52,092.86	69,166.74	60,169.38	119,304.31

## Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$108,970.00	\$935,716.00	\$141.64	\$574,949.81	-----	-----	\$360,766.19
Land sales.....	\$15,733.95	128,970.36	\$71.79	79,213.09	-----	-----	49,757.44
Total.....	\$124,703.95	1,064,686.36	\$213.43	654,162.90	-----	-----	410,523.63
Interest.....			1,363.35	35,475.46	-----	-----	
Forfeitures.....			5,279.75	10,434.75	-----	-----	
Refunds.....			169.10	169.10	-----	-----	
Operation and maintenance:							
Water-right charges.....	59,761.88	119,723.36	26,422.05	54,655.53	\$69.84	\$1,106.79	63,961.04
Interest.....			402.34	537.74			
Paid in advance.....			50.27	224.75			
Revenues:							
Rentals of irrigation water.....	95.00	170.00	95.00	170.00			
Other miscellaneous collections.....			9,823.03	39,686.44			
Miscellaneous uncollected.....							6,219.08
Grand total collections.....			43,391.46	795,516.67	-----	-----	

<sup>1</sup> Contra.

## ORLAND PROJECT, CALIFORNIA

## Appropriations:

## Fiscal year 1924—

Congressional authorizations.....	\$61,175.09
Disbursements.....	\$48,505.00
Liabilities outstanding.....	2,168.40
	50,673.40

Unencumbered balance June 30, 1924.....

10,801.69

## Fiscal year 1925—

Amount specified in appropriation act.....	40,000.00
--	-----------

## Investment

	Reclamation fund	Increase of compensation	Total
Disbursements and net transfers.....	\$1,503,489.40	\$31,620.34	\$1,535,109.74
Less collections.....	704,004.72		704,004.72
Net investment June 30, 1924.....	799,484.68	31,620.34	831,105.02

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction .....	<sup>1</sup> \$7, 181. 63	\$920, 208. 33
Supplemental construction .....	30, 070. 78	220, 288. 16
Total construction cost <sup>2</sup> .....	22, 889. 15	1, 140, 496. 49
Operation and maintenance prior to public notice (net) .....		<sup>1</sup> 11, 729. 99
		\$1, 128, 766. 50
<b>Less:</b>		
Construction revenues .....	974. 51	14, 588. 56
To be repaid water users .....	21, 914. 64	1, 114, 177. 94
<b>Repayments:</b>		
Water-right contracts .....		1, 119, 572. 75

<sup>1</sup> Contra.<sup>2</sup> Reconciliation: Net cost to date, twenty-second annual report .....

\$1, 091, 795. 87

Plus:

Miscellaneous revenues, June 30, 1923 .....

\$13, 614. 05

Cost adjustments, June 30, 1923 .....

467. 43

Operation and maintenance prior to public notice, June 30, 1923 (net) .....

11, 729. 99

25, 811. 47

Construction cost to June 30, 1923 .....

1, 117, 607. 34

Actual cost, fiscal year 1924 .....

30, 712. 15

Less transferred to secondary projects .....

7, 823. 00

22, 889. 15

Construction cost to June 30, 1924 .....

1, 140, 496. 49

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost .....	\$33, 081. 27	\$234, 558. 75	\$30, 389. 81	\$250, 119. 10
<b>To repay operation and maintenance cost:</b>				
Charges contracted .....	34, 773. 66	245, 705. 73	34, 773. 66	245, 705. 73
Penalties .....	6. 27	39. 97	27. 95	65. 72
Discounts (contra) .....	1, 708. 62	12, 107. 45	1, 708. 27	12, 108. 94
Miscellaneous revenues .....	118. 15	1, 534. 90	28. 05	1, 537. 49
Total .....	33, 189. 46	235, 173. 24	33, 120. 39	235, 200. 00
<b>Results:</b>				
Excess .....	108. 19	614. 49	2, 730. 58	
Deficit .....				14, 919. 10

*Status of current accounts receivable as of June 30, 1924 .*

	Due		Collected				Uncol- lected June 30, 1924	
	Fiscal year 1924	To June 30, 1924	Cash		Other credits			
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924		
<b>Construction:</b>								
Water-right charges .....	\$69, 600. 48	\$304, 829. 90	\$68, 374. 37	\$303, 603. 79			\$1, 226. 11	
Charges paid in advance .....				5, 385. 16				
<b>Operation and maintenance:</b>								
Water-right charges, project lands (20,174.05 acres) .....	34, 773. 66	245, 705. 73	33, 100. 12	233, 413. 90	\$1, 708. 27	\$12, 108. 94	182. 89	
Penalties and interest .....			27. 95	65. 72				
<b>Revenues:</b>								
Rentals of irrigating water .....		120, 384. 00		120, 384. 00				
Rentals grazing and farming lands .....	47. 50	79. 50	47. 50	79. 50				
Subtotal .....	47. 50	120, 463. 50	47. 50	120, 463. 50				
<b>Other collections (reclamation fund):</b>								
Construction forfeitures .....				99. 09				
Construction penalties .....				37. 42				
Miscellaneous .....			2, 952. 18	40, 936. 14				
Grand total collections .....			104, 502. 12	704, 004. 72				

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## GRAND VALLEY PROJECT, COLORADO

## Appropriations:

## Fiscal year 1924—

Congressional authorization.....		\$474,797.97
Disbursements.....	\$312,531.58	
Liabilities outstanding.....	29,396.52	

341,928.10

Unencumbered balance June 30, 1924..... 132,869.87

## Fiscal year 1925:

Amount specified in appropriation act..... 465,000.00

*Investment*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,780,674.24	\$77,068.96	\$4,837,743.20
Less collections.....	382,459.89		382,459.89
Net investment June 30, 1924.....	4,378,214.35	77,068.96	4,455,283.31

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....	\$309,605.20	\$4,252,321.42
Operation and maintenance prior to public notice (net)....	<sup>1</sup> 11,480.22	117,949.06
		\$4,370,270.48
Less:		
Construction revenues.....	1,852.68	56,945.08
To be repaid by water users.....	296,272.30	4,313,325.40
Repayments:		
Contract Orchard Mesa irrigation district.....		1,000,000.00

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$4,017,921.98

## Less:

Cost adjustments June 30, 1923.....	\$868.88	
Operation and maintenance prior to public notice, June 30, 1923 (net).....	129,429.28	
		\$130,298.16
Plus construction revenues June 30, 1923.....		55,092.40
		75,205.76

Construction cost to June 30, 1923..... 3,942,716.22

Actual cost, fiscal year 1924..... 309,605.20

Construction cost to June 30, 1924..... 4,252,321.42

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Revenues:							
Rentals of irrigating water.....	\$55,649.75	\$275,479.09	\$60,026.58	\$244,528.71	\$1,577.56	\$4,000.14	\$26,950.24
Rentals of grazing and farming lands.....	50.00	279.00	50.00	217.00	-----	-----	62.00
Total.....	55,699.75	275,758.09	60,076.58	244,745.71	1,577.56	4,000.14	27,012.24
Miscellaneous uncollected other collections (reclamation fund):							330.75
Miscellaneous.....			13,279.87	137,714.18			
Grand total collections.....			73,356.45	382,459.89			

**UNCOMPAGRE PROJECT, COLORADO**

**Appropriations:**

Fiscal year 1924—		
Congressional authorization.....		\$198,341.47
Disbursements.....	\$123,895.31	
Liabilities outstanding.....	7,981.82	
		131,857.13
Unencumbered balance June 30, 1924.....		66,484.34
Fiscal year 1925—		
Amount specified in appropriation act.....		150,000.00

### Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$8,163,374.13	\$102,130.03	\$8,265,504.16
Less collections.....	1,527,752.38	-----	1,527,752.38
Net investment June 30, 1924.....	6,635,621.75	102,130.03	6,737,751.78

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	<sup>1</sup> \$219. 73	\$6, 363, 682. 13
Value of works taken over.....		73, 162. 17
Total construction cost <sup>2</sup> .....	<sup>1</sup> 219. 73	6, 436, 844. 30
Operation and maintenance prior to public notice (net)....	<sup>1</sup> 3, 645. 48	304, 726. 50
		\$6, 741, 570. 80
<b>Less:</b>		
Construction revenues.....	788. 69	30, 971. 88
Nonreimbursible cost.....		47, 370. 81
		78, 342. 69
To be repaid by water users.....	<sup>1</sup> 4, 653. 90	6, 663, 228. 11
<b>Repayments:</b>		
Contract, Uncompahgre Valley Water Users' Association.....		6, 713, 584. 50

<sup>1</sup> Contra.

<sup>2</sup> Reconciliation: Net cost to date, twenty-second annual report.

Less operation and maintenance prior to public notice, June 30,

1923 (net)	\$308,371.98
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Plus cost adjustments, June 30, 1923.....	\$178.41
Construction revenues, June 30, 1923.....	20,182.16

Construction revenues, June 30, 1923.....	30,183.19
---	-----------

30,361.60	278,010.38
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Construction cost to June 30, 1923.....	6,437,064.08
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Construction cost to June 30, 1923.....	5,457,004.00
Actual cost, fiscal year 1924.....	219.73

6,436,844.30

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost .....	\$140, 494. 37	\$140, 494. 37	\$138, 695. 51	\$219, 737. 17
To repay operation and maintenance cost:				
Charges contracted .....	158, 395. 50	158, 395. 50	157, 841. 45	157, 841. 45
Penalties .....			179. 25	179. 25
Discounts (contra) .....	3, 181. 62	3, 181. 62	3, 312. 02	3, 312. 02
Miscellaneous revenues .....	780. 31	780. 31	2, 607. 28	3, 261. 85
Total .....	155, 994. 19	155, 994. 19	157, 408. 06	157, 970. 53
Results:				
Excess .....	15, 499. 82	15, 499. 82	18, 710. 55	
Deficit .....				61, 766. 64

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges...	\$118,237.07	\$264,498.37	\$24,915.91	\$54,014.79	\$20,335.36	\$34,832.44	\$175,651.14
Charges paid in advance.....			72.65	111.66	18,239.45	40,831.92	
Operation and maintenance:							
Irrigation districts (94,229.6 acres).....	157,841.45	157,841.45	82,923.36	82,923.36	5,628.57	5,628.57	69,289.52
Penalties and interest			124.91	124.91	54.34	54.34	
Charges paid in advance.....			1,041.99	501.61	85.70	85.70	
Revenues:							
Rentals of irrigating water.....	6,338.05	1,189,114.15	17,677.04	1,154,265.56	2,254.82	12,090.44	22,758.15
Rentals grazing and farming lands.....	45.45	197.45	45.45	197.45			
Subtotal.....	6,383.50	1,189,311.60	17,722.49	1,154,463.01	2,254.82	12,090.44	22,758.15
Miscellaneous uncollected.....							149.68
Other collections (reclamation fund) miscellaneous.....			4,420.33	235,613.04			
Grand total collections.....			129,137.66	1,527,752.38			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 66.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1924, 43.9 per cent of total accruals.

**BOISE PROJECT, IDAHO****Appropriations:****Fiscal year 1924—**

Congressional authorizations.....	\$1,521,763.36
Disbursements.....	\$1,081,926.06
Liabilities (outstanding).....	45,096.16
	<u>1,126,992.24</u>

Unencumbered balance June 30, 1924..... 394,771.12

Fiscal year 1925, amount specified in appropriation act..... 1,080,000.00

**Investment**

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$17,156,442.70	\$50,228.93	\$205,269.70	\$17,411,941.33
Less collections.....	4,848,318.84			4,848,318.84
Net investment June 30, 1924.....	12,308,123.86	50,228.93	205,269.70	12,563,622.49

# 122 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	\$1,239,438.24	\$13,683,227.97
Value of works taken over.....		29,812.50
Total construction cost <sup>1</sup> .....	1,239,438.24	13,713,040.47
Operation and maintenance prior to public notice (net).....		422,192.62
Less construction revenues.....	12,490.02	\$14,135,233.09
To be repaid by water users.....	1,226,948.22	194,581.03
<b>Repayments:</b>		
Water-right contracts (individual).....	35,192.33	7,528,052.19
Warren Act contracts.....	226.00	28,779.17
Irrigation district contracts.....	1,794,832.82	6,921,855.35
Total.....	1,830,250.15	14,478,686.71

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$12,731,409.73
Less cost adjustments June 30, 1923.....	\$17,705.89
Operation and maintenance prior to public notice June 30, 1923 (net).....	422,192.62
	439,898.51
Plus: Construction revenues.....	182,091.01
	257,807.50
Construction cost to June 30, 1923.....	12,473,602.23
Actual cost, fiscal year 1924.....	1,239,438.24
Construction cost to June 30, 1924.....	13,713,040.47

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost, regular.....	\$229,702.77	\$1,737,846.88	\$191,032.89	\$1,827,426.00
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	245,943.16	1,743,312.54	255,078.36	1,754,317.86
Penalties.....	10,620.49	25,820.67	5,929.96	27,206.95
Discounts (contra).....	4,888.90	43,043.05	2,570.40	44,095.41
Miscellaneous revenues.....	13,759.28	113,970.26	14,721.92	115,559.28
Total.....	265,434.03	1,840,060.42	273,159.84	1,852,988.68
Results: Excess.....	35,731.26	102,213.54	82,126.95	25,562.68
Operation and maintenance cost, drainage.....	114,479.55	186,592.79	206,562.05	300,822.27
<b>To repay operation and maintenance costs, drainage:</b>				
Charges contracted.....	138,793.02	411,388.79	138,256.65	480,335.27
Penalties.....	9,599.09	11,201.85	14,670.39	24,540.36
Discounts (contra).....	1,319.34	3,813.12	1,124.88	4,294.02
Total.....	147,072.77	418,777.52	151,802.16	500,587.61
Results:				
Excess.....	32,593.22	232,184.73	56,759.89	190,765.34
Deficit.....				

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
<b>Construction:</b>							
Water-right charges	\$670, 728. 53	\$2, 408, 552. 66	\$233, 945. 35	\$1, 608, 122. 87		\$25, 092. 00	\$775, 337. 79
Charges paid in advance			1, 234. 86	7, 809. 70			
<b>Operation and maintenance (regular):</b>							
Water-right charges, project lands (97, 048.51 acres)	158, 154. 87	1, 124, 061. 66	75, 688. 07	813, 089. 35	\$2, 069. 18	26, 661. 76	284, 310. 55
Warren Act lands (379.07 approximate acres)	1, 286. 51	2, 955. 94	454. 03	2, 123. 46			832. 48
Irrigation districts (68,306.11 approximate acres)	95, 636. 98	627, 300. 26	79, 920. 50	547, 611. 08	501. 22	17, 433. 65	62, 255. 53
Subtotal	255, 078. 36	1, 754, 317. 86	156, 062. 60	1, 362, 823. 89	2, 570. 40	44, 095. 41	347, 398. 56
Penalties and interest			5, 929. 96	27, 206. 95			
Charges paid in advance			. 17	. 19			
<b>Operation and maintenance (drainage):</b>							
Water-right charges, project lands (97, 048.51 acres)	92, 900. 50	326, 500. 15	75, 330. 23	217, 550. 62	875. 51	4, 044. 65	104, 904. 88
Rental lands (5,588.50 approximate acres)	5, 392. 61	13, 699. 23	4, 017. 87	8, 060. 81	249. 37	249. 37	5, 389. 05
Irrigation districts (68,306.11 approximate acres)	39, 963. 54	140, 135. 89	40, 073. 54	80, 147. 08			59, 988. 81
Total	138, 256. 65	480, 335. 27	119, 421. 64	306, 758. 51	1, 124. 88	4, 294. 02	170, 282. 74
Penalties and interest			14, 670. 39	24, 546. 36			
Charges paid in advance			10. 60	10. 60			
<b>Revenues:</b>							
Rentals of irrigating water	14, 278. 57	754, 293. 75	8, 840. 40	731, 007. 61		4, 720. 50	18, 565. 64
Power and light	10, 890. 11	128, 189. 91		96, 424. 61	10, 890. 11	31, 745. 30	
Grazing and farming lands	520. 41	20, 668. 20	520. 41	20, 579. 50			88. 70
Subtotal	25, 689. 09	903, 181. 86	9, 360. 81	848, 011. 72	10, 890. 11	36, 465. 80	18, 654. 34
Miscellaneous uncollected							2, 555. 88
Other collections (reclamation fund)—							
Construction penalties			9, 412. 85	44, 929. 75			
Construction refunds				567. 77			
Operation and maintenance refunds			36. 08	429. 87			
Miscellaneous			63, 571. 40	618, 100. 66			
Grand total collections			611, 186. 99	4, 848, 318. 84			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 32.2 per cent of total accruals. Uncollected regular operation and maintenance charges as of June 30, 1924, 19.8 per cent of total accruals. Uncollected operation and maintenance (drainage) charges as of June 30, 1924, 35.5 per cent of total accruals.



# 124 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

## KING HILL PROJECT, IDAHO

### Appropriations:

Fiscal year 1924—	
Congressional authorizations.....	\$52, 732.65
Disbursements.....	\$44, 518.99
Liabilities outstanding.....	406.17
	<u>44, 925.16</u>
Unencumbered balance June 30, 1924.....	7, 807.49
Fiscal year 1925, amount specified in appropriation act.....	<u>40, 000.00</u>

### Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1, 939, 733.30	\$103, 502.17	\$2, 043, 235.47
Less collections.....	113, 296.81		113, 296.81
Net investment June 30, 1924.....	<u>1, 826, 436.49</u>	<u>103, 502.17</u>	<u>1, 929, 938.66</u>

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....	\$7, 195.50	\$1, 892, 180.14
Operation and maintenance prior to public notice.....	* 6, 135.61	8, 532.43
		<u>\$1, 900, 713.57</u>
Less construction revenues.....	1, 381.26	12, 906.90
To be repaid by water users.....	* 321.37	1, 887, 806.67
Repayments:		
Contract, King Hill Irrigation District.....		<u>2, 000, 000.00</u>

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....		\$1, 881, 391.45
Plus miscellaneous revenues, June 30, 1923.....	\$11, 525.64	
Less cost adjustments, June 30, 1923.....	\$6, 736.59	
Operation and maintenance prior to public notice, June 30, 1923 (net).....	14, 669.04	
	<u>7, 932.45</u>	<u>3, 593.19</u>

Construction cost to June 30, 1923.....	1, 884, 964.64
Actual cost, fiscal year 1924.....	<u>7, 195.50</u>
Construction cost to June 30, 1924.....	<u>1, 892, 180.14</u>

<sup>1</sup> Contra.

### Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction: Water-right charges.....	\$127,416.97						
Revenues:							
Rents of irrigating water.....	36, 138. 21	\$88, 368. 94	\$1, 146. 46	\$50, 515. 83			\$37, 853. 11
Miscellaneous uncol- lected.....							156. 89
Other collections (reclama- tion fund).....			8, 652. 09	62, 780. 98			
Grand total collections.....			9, 798. 55	113, 296. 81			

<sup>1</sup> Contra.

## MINIDOKA PROJECT, IDAHO

## Appropriations:

## Fiscal year 1924—

Congressional authorizations.....		\$231,069.25
Disbursements.....	\$191,680.00	
Liabilities outstanding.....	33,142.81	
		<u>224,822.81</u>

Unencumbered balance June 30, 1924.....	6,246.44	
Fiscal year 1925, amount specified in appropriation act.....	370,000.00	

## Investment

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$8,658,747.48	\$15,550.90	\$118,743.46	\$8,793,041.84
Less collections.....	5,287,136.06			5,287,136.06
Net investment June 30, 1924.....	3,371,611.42	15,550.90	118,743.46	3,505,905.78

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	\$1,738,978.69	\$5,623,286.96
Supplemental construction.....		749,429.74
Value of works taken over.....		211,782.66
Total construction cost.....	\$1,738,978.69	\$6,584,499.36
Operation and maintenance prior to public notice.....	2,314.84	155,462.69
Operation and maintenance arrearages being repaid with construction.....		12,313.86
		<u>6,752,275.91</u>
<b>Less:</b>		
Contributed funds.....		709,250.06
Construction revenues.....	110,580.90	561,560.54
To be repaid by water users.....	\$1,847,244.75	5,391,464.41
<b>Repayment:</b>		
Water-right contracts (individual).....	\$248,294.40	5,605,107.13
Water-right contracts (Warren Act).....		429,412.50
Total.....	\$248,294.40	6,034,519.63

Reconciliation: Net cost to date, twenty-second annual report.....	\$8,066,977.12
Plus miscellaneous revenues to June 30, 1923.....	\$421,962.64

<b>Less:</b>		
Operation and maintenance arrearages, June 30, 1923.....	\$12,313.86	
Operation and maintenance prior to public notice June 30, 1923 (net).....	153,147.85	
	<u>165,461.71</u>	256,500.93

Construction cost to June 30, 1924.....		8,323,478.05
Actual cost, fiscal year 1924.....	83,207.81	
Transferred to American Falls.....	\$1,822,186.50	\$1,738,978.69
Construction cost to June 30, 1924.....		<u>6,584,499.36</u>

## Contra.

\$318,750 transferred to American Falls. Actual increase for fiscal year, \$70,455.60.

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$122,900.00	\$1,545,681.68	\$126,788.79	\$1,603,178.06
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	137,375.91	1,501,983.23	141,265.25	1,540,318.75
Penalties.....	6,026.86	24,764.43	4,767.71	27,056.72
Discounts (contra).....	2,640.04	19,220.60	1,843.13	19,287.53
Miscellaneous revenues.....	5,358.44	98,528.05	3,534.81	98,528.05
<b>Other credits: Arrearages to be repaid with construction.....</b>		12,313.86		12,313.86
Total.....	146,121.17	1,618,368.97	147,724.64	1,658,929.85
<b>Results: Excess.....</b>	23,221.17	72,687.29	20,935.85	55,751.79

# 126 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Un- collected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$249,465.22	\$2,383,159.84	\$174,622.52	\$1,846,230.67	\$133.37	\$154,423.24	\$382,506.93
Contributed funds	1 29,017.00	799,250.96	1 29,017.00	799,250.96			
Total 1	220,448.22	3,182,410.80	145,605.52	2,645,481.63	133.37	154,423.24	382,506.93
Charges paid in advance 1			1 209,985.55	2,056.71			
Operation and main- tenance:							
Water-right charges, project lands (119, 845 acres)	119,495.02	1,372,410.89	101,427.23	1,109,574.03	1,956.66	69,914.67	192,922.19
Warren Act lands (approximately 626,840 acres)	23,547.72	130,174.13	23,718.29	130,162.79			11.34
Total	143,042.74	1,502,585.02	125,145.52	1,239,736.82	1,956.66	69,914.67	192,933.53
Penalties and in- terest			4,714.42	26,963.11	53.29	103.61	
Charges paid in ad- vance			1 9,312.86	1,711.28			
Revenues:							
Rentals of irrigat- ing water	1,219.97	272,023.33	1,355.90	268,657.43		3,234.23	131.67
Rentals power and light	107,275.49	799,046.79	107,047.69	770,820.27	6.34	4,818.42	23,408.10
Rentals grazin gand farm lands	749.29	34,372.16	840.42	30,207.93			4,164.23
Total	109,244.75	1,105,442.28	109,244.01	1,069,685.63	6.34	8,062.65	27,704.00
Miscellaneous un- collected							22.50
Other collections (reclamation fund)—							
Construction forfeitures			6.22	9,346.03			
Construction penalties			18,144.04	62,463.49			
Construction re- funds			1,732.64	3,163.72			
Operating and maintenance refunds			786.78	8,699.21			
Miscellaneous			1 23,906.49	217,838.43			
Grand total collections			162,174.25	5,287,136.06			

1 Contra.

2 Accruals and collections \$98,517 transferred to American Falls account during fiscal year. Actual accruals for the year \$318,965.22 and collections \$244,122.52.

3 Transferred to American Falls during the year.

Actual advance (decrease)..... \$197,983.34

Net decrease..... 12,002.21

Uncollected construction water right charges as of June 30, 1924, 16.0 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 12.8 per cent of total accruals.

## AMERICAN FALLS

### Appropriations:

#### Fiscal year 1924—

Congressional authorizations	\$1,058,370.59
Disbursements	\$294,666.68
Liabilities outstanding	301,343.57
	596,010.30

Unencumbered balance June 30, 1924..... 462,360.39

Fiscal year 1925, amount specified in appropriation act..... 675,000.00

*Investment*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,098,626.75	\$3,950.25	\$2,102,596.00
Less collections.....	510,833.66		510,833.66
Net investment June 30, 1924.....	1,587,793.09	3,950.25	1,591,752.34

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....	\$2,114,831.57	\$2,114,831.57
Less construction revenues.....	180,275.86	180,275.86
To be repaid by water users.....	2,295,107.43	2,295,107.43
Repayment: Water-right contracts (Warren Act).....	4,562,782.00	4,562,782.00

<sup>1</sup> Contra.

NOTE.—Previous to this fiscal year the accounts for American Falls Reservoir were combined with those of the Minidoka project, separation being made in November, 1923. The actual cost of construction during this fiscal year was \$325,264.10, while revenue accounts showed a loss of \$110,226.43.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected		Uncollected June 30, 1924
			Cash		
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:					
Water-right charges.....	\$33,607.00	\$33,607.00	\$33,607.00	\$33,607.00	
Charges paid in advance.....			\$375,000.00	375,000.00	
Miscellaneous uncollected.....					234.61
Other collections (reclamation fund):					
Miscellaneous.....			102,226.66	102,226.66	
Grand total collections.....			510,833.66	510,833.66	

<sup>1</sup> Transferred from Minidoka project.....	\$98,517.00
To advance.....	64,910.00
Net.....	23,910.00
<sup>2</sup> Transferred from Minidoka project (prior years).....	197,963.34
Collected during this fiscal year.....	112,106.66
Adjustment as above.....	64,910.00
Adjustment as above.....	375,000.00

**HUNTLEY PROJECT, MONTANA**

Appropriations:		
Fiscal year 1924—		
Congressional authorizations.....		109,408.74
Disbursements.....	\$27,816.20	
Liabilities outstanding.....	3,516.18	
		31,832.38
Unencumbered balance June 30, 1924.....		78,074.36
Fiscal year 1925, amount specified in appropriation act.....		150,000.00

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*Investment*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,420,129.93	\$31,445.97	\$2,451,575.90
Less collections.....	824,909.47		824,909.47
Net investment June 30, 1924.....	1,595,220.46	31,445.97	1,626,666.43

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....	\$811.91	\$1,124,946.46
Supplemental construction.....	2,323.03	373,736.05
Total construction cost <sup>1</sup> .....	3,134.94	1,498,682.51
Operation and maintenance prior to public notice (net).....	<sup>2</sup> 197.06	<sup>2</sup> 621.59
Operation and maintenance arrearages being repaid with construction.....		1,214.64
Less:		\$1,499,375.56
Contributed funds.....		717.64
Construction revenues.....	288.36	16,272.48
		16,990.12
To be repaid by water users.....	2,652.53	1,482,285.44
Repayments: Water-right contracts (individual).....	<sup>2</sup> 6,126.10	1,314,490.15

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$1,475,623.45
Plus miscellaneous revenues, June 30, 1923.....	\$15,967.12
Operation and maintenance prior to public notice, June 30, 1923 (net).....	424.54
Cost adjustments, June 30, 1923.....	4,727.10
	21,138.76

Less operation and maintenance arrearages, June 30, 1923, to be repaid with construction.....

1,214.64

Construction cost to June 30, 1923.....

1,496,547.87

Actual cost fiscal year 1924.....

2,134.94

Construction cost to June 30, 1924.....

1,498,682.51

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$36,945.12	\$875,466.85	\$32,349.03	\$891,018.73
To repay operation and maintenance cost:				
Charges contracted.....	41,344.83	465,643.42	40,142.83	464,306.45
Penalties.....	3,517.29	8,633.83	3,307.09	10,212.35
Discounts (contra).....	1,060.14	7,670.49	855.27	7,758.79
Miscellaneous revenues.....	890.36	8,492.86	948.48	9,006.21
Other credits: Operation and maintenance arrearages being repaid with construction.....		1,214.64		1,214.64
Total.....	44,672.34	476,314.26	43,633.13	476,970.86
Results:				
Excess.....	7,727.22		11,284.10	
Deficit.....		399,152.59		414,038.87

<sup>2</sup> Contra.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$25,002.82	\$416,930.21	\$17,539.50	\$376,667.22		\$502.21	\$39,760.78
Contributed funds.....		717.64		717.64			
Total.....	25,002.82	417,647.85	17,539.50	377,384.86		502.21	39,760.78
Charges paid in advance.....			155.17	553.49			
Operation and maintenance:							
Water-right charges, project lands (27,890.92 acres).....	30,376.57	454,539.19	37,895.86	351,811.31	\$984.59	8,501.96	94,225.90
Penalties and interest.....			3,357.82	10,036.58	39.27	175.77	
Charges paid in advance.....			440.44	21.27			
Revenues:							
Rentals of irrigation water.....	899.37	7,236.73	638.20	6,770.64			466.69
Rentals of grazing and farming lands.....	478.56	12,674.22	583.14	12,243.13			431.09
Total.....	1,374.93	19,910.95	1,221.34	19,013.77			897.18
Miscellaneous uncollected.....							63.25
Other collections (reclamation fund):							
Construction forfeitures.....			728.06	9,360.89			
Construction penalties.....			777.64	4,142.15			
Construction refunds.....				969.75			
Operation and maintenance refunds.....				96.97			
Miscellaneous.....			1,113.63	51,518.43			
Grand total collections.....			62,088.24	824,906.47			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 9.5 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1924, 20.7 per cent of total accruals.

#### MILK RIVER PROJECT, MONTANA

##### Appropriations:

Fiscal year 1924—

Congressional authorizations.....		\$196,596.66
Disbursements.....	\$106,148.82	
Liabilities.....	5,366.69	

111,515.51

Unencumbered balance June 30, 1924.....

84,075.17

Fiscal year 1925, amount specified in appropriation act.....

\$15,000.00

#### Investment

	Reclamation fund	Judgments, Court of Claims	Increase of compensation	Total
Disbursements and net transfers.....	\$7,239,085.58	\$2,674.64	\$97,809.23	\$7,239,569.45
Less collections.....	386,276.10			386,276.10
<b>Net investment June 30, 1924.....</b>	<b>6,853,810.48</b>	<b>2,674.64</b>	<b>97,809.23</b>	<b>6,954,294.35</b>

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction <sup>1</sup> .....	\$87, 173. 56	\$8, 578, 617. 54
Operation and maintenance prior to public notice (net).....	64, 607. 21	388, 973. 17
		\$8, 967, 590. 71
<b>Less:</b>		
Construction revenues.....	1, 148. 63	61, 641. 71
To be repaid by water users.....	150, 632. 14	6, 906, 949. 00

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report ..... \$5, 782, 083. 25  
 Plus miscellaneous revenues to June 30, 1923..... 60, 493. 08

Less operation and maintenance prior to public notice to June 30, 1923 (net). \$328, 030. 58  
 Cost adjustments, June 30, 1923..... 3, 101. 77

6, 822, 576. 33

Construction cost to June 30, 1924..... 6, 491, 443. 98  
 Actual cost, fiscal year 1924..... 87, 173. 56

Construction cost to June 30, 1924..... 6, 578, 617. 54

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction: Charges paid in advance.....				\$1, 114. 00			
Revenues:							
Rentals of irrigating water.....	\$15,953.38	\$192,069.66	\$20,013.37	172, 161. 63	\$528. 47	\$1, 015. 68	\$18, 882. 26
Rentals of grazing and farming lands.....	3, 774. 63	30, 914. 34	3, 758. 20	30, 490. 69	18. 00	38. 88	384. 77
Subtotal.....	19, 728. 01	222, 974. 00	23, 771. 57	202, 652. 32	546. 47	1, 054. 56	19, 267. 12
Miscellaneous uncollected.....							1, 841. 97
Other collections (reclamation fund): Miscellaneous.....			14, 158. 80	181, 608. 78			
Grand total collections.....			37, 930. 07	385, 275. 10			

**SUN RIVER PROJECT, MONTANA**

<b>Appropriations:</b>		
Fiscal year 1924—		
Congressional authorizations.....		\$182, 389. 89
Disbursements.....	\$111, 624. 36	
Liabilities outstanding.....	7, 351. 24	
		118, 975. 70
Unencumbered balance June 30, 1924.....		63, 414. 19
Fiscal year 1925, amount specified in appropriation act.....		150, 000. 00

*Investment*

	Reclamation fund	Judgments, Court of Claims	Increase of compensa- tion (net)	Total
Disbursements and net transfers.....	\$4, 770, 553. 25	\$1, 585. 35	\$68, 915. 10	\$4, 841, 053. 70
Less collections.....	465, 916. 41			465, 916. 41
Net investment June 30, 1924.....	4, 304, 636. 84	1, 585. 35	68, 915. 10	4, 375, 137. 29

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....	\$170, 278. 67	\$4, 340, 013. 09
Operation and maintenance prior to public notice (net).....	23, 165. 93	114, 774. 61
Operation and maintenance arrearages being repaid with construction.....		2, 518. 90
		<u>\$4, 457, 306. 60</u>
Less:		
Contributed funds.....	274. 69	\$274. 69
Construction revenues.....	<sup>2</sup> 223. 85	39, 579. 56
		39, 854. 25
To be repaid by water users.....	193, 393. 76	<u>4, 417, 462. 35</u>
Repayment: Water-right contracts (individual).....	<sup>3</sup> 13, 176. 00	409, 061. 04

	Calendar 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$11, 469. 94	\$206, 350. 45	\$10, 833. 94	\$214, 728. 67
To repay operation and maintenance cost:				
Charges contracted.....	10, 126. 61	173, 438. 66	9, 786. 56	172, 701. 86
Penalties.....	809. 90	2, 563. 59	940. 34	2, 976. 92
Discounts (contra).....	289. 87	3, 007. 33	180. 98	3, 030. 76
Miscellaneous revenues.....	189. 24	2, 313. 83	192. 12	2, 316. 71
Other credits: Arrearages to be repaid with construction.....		2, 518. 90		<u>2, 518. 90</u>
Totals.....	<u>10, 865. 88</u>	<u>177, 827. 65</u>	<u>10, 738. 04</u>	<u>177, 483. 63</u>
Results: Deficit.....	<u>604. 06</u>	<u>30, 522. 80</u>	<u>95. 90</u>	<u>37, 245. 04</u>

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$4, 248, 361. 84
Plus miscellaneous revenues to June 30, 1923.....	<u>\$39, 803. 41</u>
Less operation and maintenance arrearages, June 30, 1923.....	2, 518. 90
Cost and adjustments and undistributed clearing, June 30, 1923.....	24, 303. 25
Operation and maintenance prior to public notice June 30, 1923 (net).....	<u>91, 008. 68</u>
	<u>118, 430. 83</u>
	<u>78, 627. 42</u>
Construction cost to June 30, 1923.....	<u>4, 169, 734. 42</u>
Actual cost fiscal year 1924.....	<u>170, 278. 67</u>
Construction cost to June 30, 1924 (G. L. 60, 61, and 62).....	<u>4, 340, 013. 09</u>

<sup>3</sup> Contra.



*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$6, 220. 91	\$166, 578. 11	\$7, 471. 91	\$148, 372. 27	\$116. 96	\$213. 63	\$17, 992. 21
Contributed funds.....	274. 69	274. 69	274. 69	274. 69			
Charges paid in advance.....			15. 64	29, 176. 06			
Operation and maintenance:							
Water-right charges (project lands 12,552 acres).....	4, 068. 53	158, 846. 77	9, 258. 42	131, 877. 03	375. 05	3, 245. 55	23, 724. 19
Penalties and interest.....			875. 41	2, 911. 96	64. 93	64. 96	
Charges paid in advance.....				10. 55			
Revenues:							
Rentals of irrigating water.....	4, 309. 29	52, 554. 17	4, 750. 93	25, 872. 23	309. 05	539. 74	26, 142. 20
Rentals grazing and farming lands.....	2, 792. 02	34, 124. 83	4, 068. 96	30, 814. 10			3, 310. 73
Subtotal.....	7, 101. 31	86, 679. 00	8, 839. 89	56, 696. 33	309. 05	539. 74	29, 452. 93
Miscellaneous uncollected							1, 602. 29
Other collections (reclamation fund):							
Construction forfeitures.....			376. 20	4, 447. 05			
Construction penalties.....			223. 65	2, 042. 93			
Construction refunds.....				3, 034. 70			
Operation and maintenance refunds.....				126. 91			
Miscellaneous.....			4, 965. 88	86, 955. 93			
Grand total collections.....			32, 280. 41	465, 916. 41			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 10.8 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 14.9 per cent of total accruals.

**LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA**

## Appropriations:

## Fiscal year 1924 --

Congressional authorizations.....	\$120, 563. 03
Disbursements.....	\$61, 779. 69
Liabilities outstanding.....	5, 791. 19
	<b>67, 570. 88</b>

Unencumbered balance June 30, 1924.....

52, 992. 15

Fiscal year 1925, amount specified in appropriation act.....

95, 000. 00

*Investment*

	Reclamation fund	Judgments Court of Claims	Increase compensation (net)	Total
Disbursements and net transfers.....	\$4, 065, 645. 60	\$12, 835. 88	\$30, 626. 45	\$4, 129, 107. 93
Less collections.....	322, 083. 67			322, 083. 67
<b>Net investment June 30, 1924.....</b>	<b>3, 763, 561. 93</b>	<b>12, 835. 88</b>	<b>30, 626. 45</b>	<b>3, 807, 024. 26</b>

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction <sup>1</sup> .....	\$12,791.48	\$3,088,250.76
Supplemental construction.....		77,306.38
Total construction cost.....	12,791.48	3,165,557.14
Operation and maintenance prior to public notice.....	<sup>1</sup> 368.86	<sup>1</sup> 368.86
Operation and maintenance deficits being repaid with construction.....		522,500.05
Less construction revenues.....	2,046.54	3,687,688.33
		44,660.91
To be repaid by water users.....	9,476.08	3,643,018.42
Repayment: Contracts, lower Yellowstone irrigation districts 1 and 2.....	197.60	3,614,301.81
<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....		\$3,632,949.27
Plus:		
Miscellaneous revenues to June 30, 1923.....	\$41,723.37	
Cost adjustments and undistributed clearing accounts, June 30, 1923.....	593.07	
		42,316.44
Less operation and maintenance deficits, June 30, 1923.....		3,675,265.71
		522,500.05
Construction costs to June 30, 1923.....		3,152,765.66
Actual cost fiscal year 1924.....		12,791.48
Construction cost to June 30, 1924.....		3,165,557.14
<sup>2</sup> Contra.		

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$49,868.35	\$900,702.19	\$64,239.86	\$934,170.59
To repay operation and maintenance cost:				
Charges contracted.....	49,386.03	253,560.56	54,148.35	253,560.56
Penalties.....		2.59		2.59
Discounts (contra).....		4.63		4.63
Miscellaneous revenues.....	482.32	124,643.62	<sup>1</sup> 1,196.72	124,651.77
Other credits: Operation and maintenance deficits to be repaid with construction.....		522,500.05		522,500.05
Total.....	49,868.35	900,702.19	52,946.63	900,710.34
Results: Deficit.....			11,293.23	33,460.25

# 134 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits	
			Fiscal year 1924	To June 30, 1924	To June 30, 1924	
Construction:						
Water-right charges.....	\$28,287.38	\$69,422.48	\$6,741.12	\$47,876.22		\$31,546.26
Charges paid in advance.....			197.60			
Operation and maintenance: Irriga- tion districts (58,248 approx. acres)	49,722.45	243,825.25	11,422.80	50,936.48	\$4.63	192,884.14
Penalties and interest.....				2.59		
Revenues:						
Rentals of irrigating water.....	322.31	123,587.99	199.08	122,068.26		1,519.73
Rentals grazing and farming lands	134.33	3,108.95	140.33	3,003.95		105.00
Miscellaneous uncollected.....						7.70
Other collections (reclamation fund):						
Operation and maintenance re- funds.....				190.56		
Interest and penalties.....			25,066.88	25,081.00		
Miscellaneous.....			2,081.17	72,924.01		
Grand total collections.....			22,558.18	322,063.67		

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 31 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1923, 79.1 per cent of total accruals.

## NORTH PLATTE PROJECT, NEBRASKA-WYOMING

### Appropriations:

#### Fiscal year 1924—

Congressional authorizations.....	\$1,732,331.06
Disbursements.....	\$1,422,734.47
Liabilities outstanding.....	303,194.89
	1,725,919.36

Unencumbered balance June 30, 1924.....

6,411.70

Fiscal year 1925, amount specified in appropriation act..... 1,480,000.00

### Investment

	Reclamation fund	Judgments Court of Claims	Increase of compensa- tion (net)	Total
Disbursements and net transfers.....	\$17,981,333.78	\$26,425.67	\$350,976.37	\$18,358,735.82
Less collections.....	3,931,305.09			3,931,305.09
Net investment June 30, 1924.....	14,050,028.69	26,425.67	350,976.37	14,427,430.73

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	\$1, 457, 858. 29	\$14, 515, 395. 57
Supplemental construction.....	190, 025. 64	591, 793. 55
Value of works taken over.....		41, 441. 65
<b>Total construction cost <sup>1</sup></b>	<b>1, 647, 883. 93</b>	<b>15, 148, 630. 80</b>
Operation and maintenance prior to public notice.....	168. 57	496, 558. 00
Operation and maintenance arrearages being repaid with construction.....		82, 413. 95
		<b>\$15, 727, 602. 84</b>
<b>Less:</b>		
Contributed funds.....	10, 386. 15	48, 062. 64
Construction revenues.....	20, 409. 69	103, 634. 20
		<b>151, 696. 84</b>
<b>To be repaid by water users.....</b>	<b>1, 617, 256. 66</b>	<b>15, 575, 906. 00</b>
<b>Repayment:</b>		
Water-right contracts (individuals).....	8, 736. 00	7, 836, 665. 78
Water-right contracts (Warren Act).....	380. 00	1, 074, 013. 50
Contract, Northport irrigation district.....	1, 050, 000. 00	1, 050, 000. 00
Special contracts.....	4, 211. 50	39, 271. 25
<b>Total.....</b>	<b>1, 063, 327. 50</b>	<b>9, 999, 950. 53</b>

<sup>1</sup> Reconciliation: Net cost to date twenty-second annual report..... \$14, 011, 574. 27  
 Plus miscellaneous revenues to June 30, 1923..... 83, 224. 51

**14, 094, 798. 78**

**Less:**  
 Operation and maintenance arrearages, June 30, 1923..... \$82, 413. 95  
 Operation and maintenance prior to public notices to June 30, 1923 (net)..... 496, 389. 52  
 Cost adjustments and undistributed clearing accounts, June 30, 1923..... 15, 248. 44

**594, 051. 91**

Construction cost to June 30, 1923..... 13, 500, 746. 87  
 Actual cost, fiscal year 1924..... 1, 647, 883. 93

Construction cost to June 30, 1924..... 15, 148, 630. 80

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
<b>Operation and maintenance cost.....</b>	<b>\$202, 540. 07</b>	<b>\$1, 914, 408. 17</b>	<b>\$214, 226. 54</b>	<b>\$2, 011, 150. 28</b>
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	170, 443. 37	1, 936, 678. 35	185, 101. 11	1, 977, 730. 49
Penalties.....	1, 800. 27	26, 151. 95	1, 490. 32	26, 702. 70
Discounts (contra).....	1, 091. 54	32, 391. 26	933. 53	32, 561. 83
Miscellaneous revenues.....	1, 734. 75	21, 735. 36	2, 240. 18	23, 210. 84
<b>Other credits: Operation and maintenance arrearages to be repaid with construction.....</b>		<b>82, 413. 95</b>		<b>82, 413. 95</b>
<b>Total.....</b>	<b>172, 896. 85</b>	<b>2, 034, 588. 35</b>	<b>187, 898. 08</b>	<b>2, 077, 496. 15</b>
<b>Results:</b>				
Excess.....		120, 180. 18		66, 345. 87
Deficit.....	29, 653. 22		26, 328. 46	

# 136 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$402,047.71	\$2,778,032.98	\$57,566.48	\$1,732,646.25	\$663.94	\$34,958.86	\$1,010,427.87
Contributed funds	11,600.00	48,062.64	11,600.00	44,393.76			2,068.88
Total	413,647.71	2,826,095.62	69,166.48	1,777,040.01	663.94	34,958.86	1,012,486.75
Charges paid in advance			1 63.53	535.60			
Operation and main- tenance:							
Water-right charges, project lands (108,010.07 acres)	143,724.24	1,728,815.27	26,365.65	1,162,167.46	1,052.78	42,285.58	524,362.23
Warren Act lands (127,970 approximate acres)	18,628.83	226,167.18	25,823.25	203,044.11	72.49	128.67	22,994.40
Irrigation districts (16,350 approximate acres)	22,748.04	22,748.04					22,748.04
Total	185,101.11	1,977,730.49	52,188.90	1,365,211.57	1,125.27	42,414.25	570,104.67
Penalties and interest			1,308.46	26,098.26	181.86	604.44	
Charges paid in advance			28.23	28.23			
Revenues:							
Rentals of irrigating water	53,741.65	222,583.37	40,340.83	208,596.44	8.00	10.00	13,976.93
Rentals power and light	30,255.10	113,864.58	29,187.79	97,200.43	1,862.29	14,255.59	2,346.56
Rentals grazing and farming lands	2,393.16	83,070.08	3,121.52	77,556.38			5,512.70
Subtotal	86,389.91	419,518.03	72,650.14	383,413.25	1,870.29	14,265.59	21,836.19
Miscellaneous uncollected							9,250.40
Other collections (reclamation fund):							
Construction forfeitures			126.50	6,102.75			
Construction penalties			12,720.11	92,759.06			
Construction refunds				1,440.85			
Operation and maintenance refunds				488.96			
Miscellaneous			40,763.86	278,186.55			
Grand total collections			248,889.15	3,931,305.09			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 36.4 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1924, 28.8 per cent of total accruals.

## NEWLANDS PROJECT, NEVADA

### Appropriations:

Fiscal year 1924—	
Congressional authorizations	\$700,930.12
Disbursements	\$312,065.32
Liabilities outstanding	36,500.54
	<b>349,165.86</b>

Unencumbered balance June 30, 1924	351,734.26
Fiscal year 1925, amount specified in appropriation act	400,000.00

*Investment*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$8,842,845.25	\$90,008.10	\$8,932,851.35
Less collections.....	1,761,359.32		1,761,359.32
Net investment June 30, 1924.....	7,081,485.93	90,008.10	7,171,492.03

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	\$144,286.15	\$6,663,667.33
Supplemental construction.....	163,859.83	753,955.72
Value of works taken over.....		37,082.61
Total construction <sup>1</sup> .....	308,145.98	7,454,705.66
Operation and maintenance prior to public notice.....	<sup>2</sup> 174.28	<sup>2</sup> 1,354.51
Operation and maintenance arrearages being repaid with construction.....		2,022.93
<b>Less:</b>		
Construction revenues.....	14,285.22	\$7,455,374.08
To be repaid by water users.....	293,676.48	172,135.73
<b>Repayment:</b>		
Water right contracts (individual).....	<sup>2</sup> 53,357.00	1,964,655.53
Contract, Truckee-Carson Irrigation district.....	3,528.00	623,794.48
Total.....	<sup>2</sup> 49,829.00	2,588,450.01

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$109,358.66	\$1,097,887.70	\$118,875.05	\$1,183,390.30
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	107,589.62	1,011,535.14	110,824.76	1,011,324.02
Penalties.....	4,544.75	12,970.38	4,156.67	15,445.64
Discounts (contra).....	4,475.10	17,844.38	2,106.60	17,893.37
Miscellaneous revenues.....	909.27	18,867.97	856.77	19,125.97
<b>Other credits: Operation and maintenance arrearage to be repaid with construction.....</b>		2,022.93		2,022.93
Total.....	108,568.54	1,027,552.04	113,731.60	1,030,025.19
<b>Result: Deficit.....</b>	790.12	70,335.66	5,143.45	153,365.11

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$6,990,498.85

Plus:

Miscellaneous revenues to June 30, 1923..... \$157,840.51  
 Operation and maintenance prior to public notice, June 30, 1923 (net)..... 1,180.23

159,020.74

Less:

Operation and maintenance arrearages to June 30, 1923..... 2,022.93  
 Cost adjustments and undistributed clearing accounts, June 30, 1923..... 936.98

2,959.91

Construction cost to June 30, 1923..... 7,148,659.68  
 Actual cost, fiscal year 1924..... 806,145.98

Construction cost to June 30, 1924..... 7,454,705.66

<sup>2</sup> Contra.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
<b>Construction:</b>							
Water-right charges.....	\$46,821.92	\$592,191.97	\$30,386.45	545,162.11	\$783.95	\$6,788.90	\$40,240.96
Charges paid in advance.....			67.17	1,387.07			
<b>Operation and maintenance:</b>							
Water-right charges.....	108,690.33	913,689.59	87,666.85	776,648.80	4,399.43	28,277.55	108,763.24
Penalties and interest.....			3,833.75	14,770.82	322.02	674.82	
Charges paid in advance.....			22.47	605.40	60.16	60.16	
<b>Revenues:</b>							
Rentals of irrigating water.....	2,425.05	19,361.27	642.20	17,558.92	1,761.85	1,761.85	40.50
Rentals of power and light.....	18,476.81	202,837.37	18,646.06	176,159.07	18.00	25,503.75	1,172.55
Rentals of grazing and farming lands.....	5,041.78	29,626.40	3,571.28	27,709.90			1,916.50
Subtotal.....	25,943.64	251,825.04	22,860.14	221,427.89	1,779.85	27,267.60	3,129.55
Miscellaneous uncollected.....							628.09
Other collections (reclamation fund):							
Construction forfeitures.....			492.00	4,825.60			
Construction penalties.....			1,580.22	7,351.55			
Construction refunds.....			89.55	384.55			
Operation and maintenance refunds.....				111.96			
Miscellaneous.....			5,800.46	188,683.57			
Grand total collections.....			152,254.12	1,761,359.32			

1 Contra.

Uncollected construction water-right charges as of June 30, 1924, 6.8 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 11.9 per cent of total accruals.

**CARLSBAD PROJECT, NEW MEXICO****Appropriations:**

Fiscal year 1924—

Congressional authorizations.....		\$86,347.84
Disbursements.....	\$40,365.23	
Liabilities outstanding.....	1,151.84	
		41,497.07

Unencumbered balance June 30, 1924.....

44,850.77

Fiscal year 1925, amount specified in appropriation act.....

30,000.00

**Investment**

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,961,658.26	\$29,972.09	\$1,991,630.35
Less collections.....	1,065,814.87		1,065,814.87
Net investment June 30, 1924.....	905,838.39	29,972.09	935,810.48

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....		\$1,418,696.90
Operation and maintenance prior to public notice (net).....	<sup>2</sup> \$1,190.27	<sup>2</sup> 11,705.28
Operation and maintenance arrearages being repaid with construction.....		1,934.00
		\$1,408,925.62
Less:		
Contributed funds.....		7,980.06
Construction revenues.....	994.19	15,181.29
		23,161.35
To be repaid by water users.....	<sup>2</sup> 2,184.46	1,385,764.27
Repayment:		
Water-right contracts (individuals).....		1,423,892.75

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$38,744.00	\$514,171.30	\$42,528.45	\$538,537.21
To repay operation and maintenance cost:				
Charges contracted.....	54,505.14	502,241.38	54,505.14	502,241.38
Penalties.....	6,653.82	16,565.61	7,100.50	21,315.07
Discounts (contra).....	1,398.27	7,315.48	1,619.33	7,749.23
Miscellaneous revenues.....	526.18	12,711.08	2,014.42	14,297.62
Other credits: Operation and maintenance arrearages being repaid with construction.....		1,934.00		1,934.00
Total.....	60,286.87	526,136.59	62,000.73	532,038.84
Results:				
Excess.....	21,542.87	11,965.29	19,471.28	-----
Deficit.....				6,468.37

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$1,395,928.79  
 Plus miscellaneous revenues to June 30, 1923..... \$24,702.11  
 Less operation and maintenance arrearages, June 30, 1923..... 1,934.00  
 22,768.11

Construction cost to June 30, 1923..... 1,418,696.90  
 Construction cost to June 30, 1924..... 1,418,696.90

<sup>2</sup> Contra.



*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$57,538.92	\$475,435.19	\$69,700.37	\$452,168.10			\$23,267.06
Contributed funds.....		7,980.06		7,980.06			
Total.....	57,538.92	483,415.25	69,700.37	460,148.16			23,267.06
Charges paid in advance.....			1400.44	729.11			
Operation and maintenance:							
Water-right charges, project lands (25,040 acres).....	54,505.14	502,241.38	78,758.73	470,139.33	\$1,619.33	\$7,749.23	24,352.82
Penalties and interest.....			7,100.50	21,315.07			
Revenues:							
Rentals of irrigating water.....	2,691.32	21,933.01	2,691.32	21,933.01			
Rentals of grazing and farming lands.....	1,470.31	13,166.24	1,470.31	12,631.80			534.44
Subtotal.....	4,161.63	35,099.25	4,161.63	34,564.81			534.44
Miscellaneous uncollected.....							171.73
Other collections (reclamation fund):							
Construction forfeitures.....				299.70			
Construction penalties.....			5,291.13	24,127.13			
Miscellaneous.....			1,732.00	44,521.56			
Grand total collections.....			166,343.92	1,055,814.87			

1 Contra.

Uncollected construction water-right charges as of June 30, 1924, 4.89 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 4.85 per cent of total accruals.

**RIO GRANDE PROJECT, NEW MEXICO-TEXAS****Appropriations:**

## Fiscal year 1924—

Congressional authorizations.....	\$1,042,478.07
Disbursements.....	\$908,670.90
Liabilities outstanding.....	92,124.07
	1,000,794.97

Unencumbered balance June 30, 1924..... 41,683.10

Fiscal year 1925, amount specified in appropriation act..... 706,000.00

**Investment**

	Reclamation fund	Rio Grande Dam	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$14,215,005.91	\$1,000,000.00	\$438,671.11	\$15,654,277.02
Less collections.....	2,553,592.76			2,553,592.76
Net investment June 30, 1924.....	11,662,013.15	1,000,000.00	-438,671.11	13,100,684.26

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....	\$908, 013. 19	\$13, 334, 707. 64
Operation and maintenance prior to public notice (net).....	<sup>2</sup> 8, 927. 68	<sup>2</sup> 255, 185. 72
		\$13, 079, 521. 92
Less:		
Construction revenues.....	1, 659. 56	35, 892. 96
Nonreimbursable: Rio Grande Dam appropriation.....		1, 000, 000. 00
		1, 035, 892. 96
To be repaid by water users.....	997, 425. 95	12, 043, 628. 96
Repayment:		
Contracts, Elephant Butte irrigation district and El Paso water improvement district No. 1.....		7, 630, 000. 00

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$193, 523. 53	\$641, 123. 57	\$216, 825. 18	\$765, 791. 30
To repay operation and maintenance cost:				
Charges contracted.....	198, 345. 34	643, 927. 05	194, 783. 41	645, 368. 91
Penalties.....	<sup>1</sup> 2, 864. 84	1, 682. 96	<sup>1</sup> 78. 62	1, 426. 46
Discounts (contra).....		4, 486. 44		4, 486. 44
Miscellaneous revenues.....	345. 64	645. 64	45. 64	645. 64
Total.....	195, 826. 14	641, 769. 21	194, 750. 43	642, 964. 67
Results:				
Excess.....	2, 302. 61	645. 64		
Deficit.....			22, 074. 75	122, 836. 73

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$12, 146, 114. 48
Plus:	
Miscellaneous revenues to June 30, 1923.....	\$34, 233. 40
Operation and maintenance prior to public notice June 30, 1923.....	246, 258. 04
Cost adjustments and undistributed clearing accounts, June 30, 1923.....	88. 58
	290, 580. 02
Construction cost to June 30, 1923.....	12, 426, 694. 46
Actual cost, fiscal year 1924.....	908, 013. 19
Construction cost to June 30, 1924.....	13, 334, 707. 64

<sup>2</sup> Contra.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$57,538.92	\$475,435.19	\$69,700.37	\$452,168.10			\$23,267.09
Contributed funds		7,980.06		7,980.06			
Total	57,538.92	483,415.25	69,700.37	460,148.16			23,267.09
Charges paid in advance			1400.44	729.11			
Operation and maintenance:							
Water-right charges, project lands (25,040 acres)	54,505.14	502,241.38	78,758.73	470,139.33	\$1,619.33	\$7,749.23	24,352.82
Penalties and interest			7,100.50	21,315.07			
Revenues:							
Rentals of irrigating water	2,691.32	21,933.01	2,691.32	21,933.01			
Rentals of grazing and farming lands	1,470.31	13,196.24	1,470.31	12,631.80			534.44
Subtotal	4,161.63	35,099.25	4,161.63	34,564.81			534.44
Miscellaneous uncollected							171.73
Other collections (reclamation fund):							
Construction forfeitures				269.70			
Construction penalties			5,291.13	24,127.13			
Miscellaneous			1,732.00	44,521.56			
Grand total collections			166,343.92	1,055,814.87			

<sup>1</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 4.39 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 4.85 per cent of total accruals.

**RIO GRANDE PROJECT, NEW MEXICO-TEXAS****Appropriations:****Fiscal year 1924—**

Congressional authorizations		\$1,042,478.07
Disbursements	\$908,670.90	
Liabilities outstanding	92,124.07	
		1,000,794.97

Unencumbered balance June 30, 1924		\$1,682.10
Fiscal year 1925, amount specified in appropriation act		706,000.00

*Investment*

	Reclamation fund	Rio Grande Dam	Increase of compensation (net)	Total
Disbursements and net transfers	\$14,215,605.91	\$1,000,000.00	\$438,671.11	\$15,654,277.02
Less collections	2,553,592.76			2,553,592.76
Net investment June 30, 1924	11,662,013.15	1,000,000.00	-438,671.11	13,199,989.29

# FINANCIAL DATA

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	Fiscal year 1924	To June 30, 1923
<b>Irrigation works:</b>		
Original construction <sup>1</sup>	\$806,012.19	\$12,244,707.64
Operation and maintenance prior to public notice (net)	\$4,927.94	\$27,185.72
		\$12,271,893.36
<b>Revenues:</b>		
Construction revenues	\$428.74	\$1,442.70
Nonreimbursable: Rio Grande Dam appropriation		\$100,000.00
		\$101,442.70
To be repaid by water users	\$428.74	\$1,442.70
<b>Repayment:</b>		
Contracts, Elephant Butte irrigation district and El Paso water improvement district No. 1		\$1,442.70

	Operating year 1923	Fiscal year 1924	From June 30, 1923	To June 30, 1924
<b>Operation and maintenance cost</b>	\$28,223.3	\$24,223.3	\$28,223.3	\$24,223.3
<b>To repay operation and maintenance cost</b>				
Charges contracted	\$2,223.3	\$2,223.3	\$2,223.3	\$2,223.3
Penalties	\$1,223.3	\$1,223.3	\$1,223.3	\$1,223.3
Discounts (contra)	\$1,223.3	\$1,223.3	\$1,223.3	\$1,223.3
Miscellaneous revenues	\$2,223.3	\$2,223.3	\$2,223.3	\$2,223.3
<b>Total</b>	\$28,223.3	\$24,223.3	\$28,223.3	\$24,223.3
<b>Results:</b>				
Excess	\$2,223.3	\$2,223.3	\$2,223.3	\$2,223.3
Deficit				

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report

Plus:

Miscellaneous revenues to June 30, 1923

Operation and maintenance prior to public notice June 30, 1923

Cost adjustments and undistributed charges, June 30, 1923

Construction cost to June 30, 1923

Actual cost, fiscal year 1924

Construction cost to June 30, 1924

<sup>1</sup> Contra.

# 142 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Un- collected June 30, 1924
			Cash		Other credits		
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction: Water- right charges.....	\$198,514.80	\$275,014.80	\$198,523.80	\$275,014.80			
Operation and mainten- ance:							
Irrigation districts (approximately 150,000 acres).....	208,234.00	597,312.40	201,102.44	585,694.40		\$4,486.44	\$7,131.56
Penalties and interest.			178.62	1,426.46			
Charges paid in ad- vance.....			230.16	875.52			
Revenues:							
Rentals of irrigating water.....	8,927.68	1,118,403.12	5,369.05	1,080,816.31			37,586.81
Rentals of power and light.....		2,243.33		2,243.33			
Rentals of grazing and farm lands.....	151.50	1,951.70	166.50	1,951.70			
Subtotal.....	9,079.18	1,122,598.15	5,535.55	1,085,011.34			37,586.81
Miscellaneous uncollected Other collections (recla- mation fund):							13,829.12
Construction penal- ties.....			942.96	1,873.55			
Operation and main- tenance refunds.....				333.52			
Miscellaneous.....			30,144.63	603,363.17			
Grand total collec- tions.....			436,400.92	2,553,592.76			

<sup>1</sup> Contra.

Uncollected operation and maintenance charges as of June 30, 1924, 1.2 per cent of total accruals.

## WILLISTON PROJECT, NORTH DAKOTA

Appropriations:		
Fiscal year 1924—		
Congressional authorizations.....		\$143,607.40
Disbursements.....	\$94,876.91	
Liabilities outstanding.....	5,292.21	99,669.12
Unencumbered balance June 30, 1924.....		43,938.28
Fiscal year 1925, amount specified in appropriation act.....		100,000.00

## Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,235,546.27	\$25,194.28	\$1,310,740.55
Less collections.....	457,976.62		457,976.62
Net investment June 30, 1924.....	827,569.65	25,194.28	852,763.93

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....		\$470,798.69
Supplemental construction.....	\$27,984.18	27,984.18
Total construction cost <sup>1</sup> .....	27,984.18	498,782.87
Operation and maintenance prior to public notice (net).....		<sup>2</sup> 165.00
Operation and maintenance deficits and arrearages being repaid with construction.....	168,471.56	168,471.56
Less construction revenues.....	<sup>2</sup> 445.71	\$667,089.43
To be repaid by water users.....	196,901.45	10,080.80
Repayment: Contract, Williston Irrigation district.....	196,471.56	657,008.63
		489,275.30

See footnotes <sup>1</sup> and <sup>2</sup> on page 143.

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$75,500.92	\$765,537.70	\$70,374.74	\$797,309.24
To repay operation and maintenance cost:				
Charges contracted.....	\$ 135,572.16	26,677.75	\$ 131,672.07	26,677.75
Penalties.....		1,918.76		1,918.76
Miscellaneous revenues.....	45,699.97	392,900.88	45,407.34	415,097.84
Other credits:				
Operation and maintenance deficits and arrearages being repaid with construction.	168,471.56	168,471.56	168,471.56	168,471.56
Operation and maintenance deficit written off.....		178,667.20		178,667.20
Total.....	78,599.37	768,636.15	82,206.83	790,833.11
Result:				
Excess.....	3,098.45	3,098.45	11,832.09	
Deficit.....				6,476.13

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$460,107.18

Plus:

Miscellaneous revenues to June 30, 1923..... \$16,526.51  
 Operation and maintenance prior to public notice, June 30, 1923 (net)..... 165.00  
 10,691.51

Construction cost to June 30, 1924..... 470,798.69

Actual cost, fiscal year 1924..... 27,064.18

Construction cost to June 30, 1924..... 498,782.87

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected		Uncol- lected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		
			Fiscal year 1924	To June 30, 1924	
Construction charges paid in advance.....				\$8,250.63	
Operation and maintenance irrigation districts (8,687.4 approximate acres).....	\$45,242.55	\$26,677.75		26,677.75	
Penalties and interest.....				1,918.76	
Revenues:					
Rentals of irrigating water.....		2,117.28		2,117.28	
Rentals, power and light.....	44,288.70	409,980.20	\$44,547.00	409,980.00	\$3,256.20
Rentals, grazing and farming lands.....		249.98		249.98	
Subtotal.....	44,288.70	412,308.46	44,547.00	409,047.26	3,256.20
Miscellaneous uncollected.....					7.55
Other collections (reclamation fund):					
Construction forfeitures.....				655.32	
Miscellaneous.....			979.59	11,426.90	
Grand total collections.....			45,526.59	457,976.62	

<sup>1</sup> Contra.

**UMATELLA PROJECT, OREGON**

**Appropriations:**

Fiscal year 1924—

Congressional authorizations..... \$1,006,827.43  
 Disbursements..... \$736,628.80  
 Liabilities outstanding..... 199,382.43

\$35,811.20

Unencumbered balance June 30, 1924..... 69,918.14

Fiscal year 1925, amount specified in appropriation act..... 940,000.00

## Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,291,898.47	\$47,224.80	\$4,339,123.27
Less collections.....	910,352.79		910,352.79
Net investment June 30, 1924.....	8,381,545.68	47,224.80	3,428,770.48

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....	\$541,384.42	\$2,918,869.51
Supplemental construction.....	134,842.18	461,862.41
Total construction cost <sup>1</sup> .....	676,226.60	3,380,731.92
Operation and maintenance deficits and arrearages being repaid with construction.....		190,627.95
Contributed funds.....	1,000.00	1,000.00
Construction revenues.....	644.00	21,775.17
		22,775.17
To be repaid by water users.....	674,582.60	3,548,584.70
Repayment:		
Water-right contracts (individual).....		9,897.00
Water-right contracts (Warren Act).....	695,000.00	699,800.00
Contracts, Hermiston Irrigation district and West Extension Irrigation district.....		2,690,376.97
Total.....	695,000.00	3,400,073.97

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$37,600.67	\$588,429.30	\$39,968.05	\$610,023.03
To repay operation and maintenance cost:				
Charges contracted.....	36,688.44	368,206.39	36,688.44	368,206.39
Penalties.....	<sup>1</sup> 1,162.23	6,347.57	23.84	6,371.41
Discounts (contra).....	8.87	3,285.48	7.74	3,294.17
Miscellaneous revenues.....	1,285.11	36,509.09	1,688.30	37,626.66
Other credits: Operation and maintenance deficits and arrearages being repaid with construction.....		190,627.95		190,627.95
Total.....	36,802.45	598,404.57	38,392.84	599,538.14
Results:				
Excess.....		9,975.27		
Deficit.....	798.22		1,578.21	10,484.89

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$2,574,027.84

Plus miscellaneous revenues to June 30, 1923..... 21,131.17

2,895,159.01

Less operation and maintenance deficits and arrearages:

June 30, 1923..... \$190,627.95

Cost adjustments and undistributed clearing accounts, June 30, 1923..... 26.74

190,653.69

Construction cost to June 30, 1923.....

2,704,506.32

Actual cost, fiscal year 1924.....

676,226.60

Construction cost to June 30, 1924.....

3,380,731.92

<sup>2</sup> Contra.

## Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$76,150.17	\$482,782.68	\$24,809.24	\$381,408.62			\$101,374.06
Contributed funds.....	1,000.00	1,000.00	1,000.00	1,000.00			
Totals.....	77,150.17	483,782.68	25,809.24	382,408.62			101,374.06
Charges paid in advance			2,190.43	15,129.95			
Operation and maintenance:							
Water-right charges project lands (111 acres).....	230.38	2,003.92	125.79	1,580.29	\$3.59	\$102.63	321.00
Warren Act lands (120 acres).....	136.50	611.45	78.85	510.94	4.15	24.01	76.50
Irrigation districts (24,356 acres).....	42,149.06	319,768.36	38,750.93	281,778.32		3,167.53	34,822.51
Total.....	42,522.54	322,383.73	38,965.57	283,869.55	7.74	3,294.17	35,220.01
Penalties and interest.....			23.84	6,371.41			
Charges paid in advance.....				390.00			
Revenues:							
Rentals of irrigation water.....	1,207.80	33,308.04	1,207.80	33,308.04			
Rentals of grazing lands.....	822.08	2,101.55	522.05	2,061.55			50.00
Subtotal.....	1,729.88	35,409.59	1,729.85	35,369.59			50.00
Miscellaneous uncollected.....							627.77
Other collections (reclamation fund):							
Construction forfeitures.....				6,701.14			
Construction penalties.....			7,911.77	17,759.60			
Construction refunds.....				63.00			
Operation and maintenance refunds.....				9.55			
Miscellaneous.....			13,848.34	162,290.38			
Grand total collections.....			86,068.18	910,352.79			

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1924, 21 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 10.9 per cent of total accruals.

## KLAMATH PROJECT, OREGON-CALIFORNIA

## Appropriations:

Fiscal year 1924—		
Congressional authorizations.....		\$785,742.58
Disbursements.....	\$345,528.83	
Liabilities outstanding.....	246,932.66	
		502,461.49
Unencumbered balance June 30, 1924.....		143,281.09
Fiscal year 1925—amount specified in appropriation act.....		695,000.00

## Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$5,223,646.60	\$72,415.97	\$5,296,062.66
Less collections.....	1,392,048.08		1,392,048.08
Net investment June 30, 1924.....	3,831,598.61	72,415.97	3,904,014.58



	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....	\$381,244.14	\$3,914,292.33
Supplemental construction.....	12,605.69	545,873.53
Value of works taken over.....		6,706.07
Total construction cost <sup>1</sup> .....	393,851.83	\$4,466,870.93
Operation and maintenance prior to public notice (net).....	1,719.81	62,152.27
Operation and maintenance arrearages being repaid with construction.....		3,712.03
Less construction revenues.....	16,405.10	4,532,735.23
To be repaid by water users.....	379,166.54	177,443.41
Repayment:		4,355,291.82
Water-right contracts (individual).....	15,011.50	262,491.20
Water-right contracts (Warren Act).....		457,981.24
Contracts with irrigation districts.....	603,489.71	2,990,376.76
Special contracts.....	120,620.00	254,508.40
Total.....	799,098.21	3,965,357.60

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$58,540.37	\$618,608.28	\$64,086.84	\$657,791.30
To repay operation and maintenance cost:				
Charges contracted.....	58,875.53	618,082.45	56,475.22	615,632.14
Penalties.....	72.44	2,730.07	77.61	2,769.51
Discounts (contra).....	93.22	4,613.42	72.00	4,537.65
Miscellaneous revenues.....	957.06	12,404.01	267.68	11,803.96
Other credits: Operation and maintenance arrearages being repaid with construction.....		3,712.03		3,712.03
	59,811.83	632,265.14	56,848.51	629,379.99
Results:				
Excess.....	1,271.46	13,756.86		
Deficit.....			7,238.33	28,411.31

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$3,978,175.37

Plus miscellaneous revenues to June 30, 1923..... \$161,038.31

Less:

Operation and maintenance arrearages, June 30, 1923..... 3,712.03

Cost adjustments and undistributed clearing, June 30, 1923..... 2,050.45

Operation and maintenance prior to public notice, June 30, 1923 (net)..... 60,432.46

66,194.94

94,843.37

Construction cost to June 30, 1923.....

Actual cost fiscal year 1924..... 4,073,019.10

Construction cost to June 30, 1924 (G. L. 60, 61, and 62)..... 393,851.83

<sup>1</sup> Contra.

## Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges.....	\$64,597.45	\$622,409.08	\$63,865.66	\$500,155.69			\$62,253.34
Charges paid in advance.....			4,625.86	5,048.57			
Operation and maintenance:							
Water-right charges, project lands (individual contracts) (3,492 acres).....	2,595.89	15,826.96	2,753.38	12,744.02	\$72.00	\$314.64	2,768.32
Warren Act lands (9,834.8 approximate acres).....	754.83	2,847.15	700.96	2,640.64			206.51
Irrigation districts (41,485.9 approximate acres).....	52,912.25	530,295.76	74,342.85	473,843.99		29,816.96	26,634.81
Other lands (5,000 approxi- mate acres).....	1200.00						
Total.....	56,062.97	548,969.89	77,797.19	499,238.65	72.00	30,181.60	29,609.64
Penalties and interest.....			77.61	2,769.51			
Charges paid in advance.....			14.38	70.19			
Revenues:							
Rentals of irrigating water.....	967.68	43,981.31	1,264.60	43,792.43			188.86
Rentals power and light.....	537.65	7,697.16	537.65	7,697.16			
Grazing and farming lands.....	18,366.99	176,765.15	18,182.99	176,145.15	\$4.00	\$4.00	536.00
Subtotal.....	19,872.32	228,443.62	19,985.24	227,634.74	\$4.00	\$4.00	724.86
Miscellaneous uncollected.....							5,664.81
Other collections (reclama- tion fund):							
Construction forfeitures.....			5,036.90	5,045.90			
Construction penalties.....			51.25	2,321.27			
Construction refunds.....			895.97	2,467.65			
Operation and mainte- nance penalties (dis- trict contracts).....			1,857.63	2,308.26			
Operation and mainte- nance refunds.....				60.75			
Miscellaneous.....			5,405.99	64,936.88			
Grand total collections.....			167,548.40	392,048.08			

<sup>1</sup> Accruals and collections for the fiscal year, \$87, refund \$624.65.

<sup>2</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 5.2 per cent of total accruals.

Uncollected operations and maintenance charges as of June 30, 1924, 5.4 per cent of total accruals.

## BELLE FOURCHE PROJECT, SOUTH DAKOTA

## Appropriations:

## Fiscal year 1924—

Congressional authorizations.....		\$92,301.01
Disbursements.....	\$51,313.04	
Liabilities outstanding.....	5,980.83	
		57,243.37

Unencumbered balance June 30, 1924.....

Fiscal year 1925, amount specified in appropriation act..... 35,057.64

185,000.00

## Investment

	Reclamation fund	Judgments Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,586,507.94	\$37,170.22	\$49,755.89	\$4,673,434.05
Less collections.....	1,084,471.75			1,084,471.75
<b>Net investment June 30, 1924.....</b>	<b>3,502,036.19</b>	<b>37,170.22</b>	<b>49,755.89</b>	<b>3,588,962.30</b>

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....		\$3,531,454.53
Supplemental construction.....		34,609.88
Total construction cost <sup>1</sup> .....		3,566,124.41
Operation and maintenance prior to public notice (net).....		<sup>2</sup> 1,989.03
Operation and maintenance deficits and arrearages being repaid with construction.....	\$486,044.89	506,436.99
		\$4,070,572.37
<b>Less:</b>		
Construction revenues.....	<sup>2</sup> 525.00	16,865.35
To be repaid by water users.....	486,569.89	4,054,007.02
Repayment: Contract, Belle Fourche irrigation district.....	1,747,999.03	4,345,277.42

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$63,279.27	\$1,014,749.94	\$64,186.91	\$1,044,205.99
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	<sup>2</sup> 307,450.83	563,721.89	<sup>2</sup> 307,141.38	563,721.89
Penalties.....	16,458.44	31,955.32	16,739.16	33,388.57
Discounts (contra).....	<sup>2</sup> 2,885.86	9,241.55	<sup>2</sup> 3,069.32	9,241.55
Miscellaneous revenues.....	2,090.54	10,691.20	2,422.92	11,467.99
Other credits: Operation and maintenance deficits and arrearages being repaid as con- struction.....	486,044.89	506,436.99	486,044.89	506,436.99
Total.....	200,028.90	1,103,563.85	201,134.91	1,104,770.53
<b>Results: Expenses.....</b>	<b>136,749.63</b>	<b>88,813.91</b>	<b>136,948.00</b>	<b>80,564.94</b>

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$3,567,437.13

Plus:

Miscellaneous revenues to June 30, 1923..... \$17,090.35

Operation and maintenance prior to public notice June 30, 1923 (net)..... 1,989.03

19,079.38

Less operation and maintenance deficits and arrearages, June 30, 1923.....

3,896,516.51

38,382.10

Construction cost, June 30, 1923.....

3,566,124.41

Construction cost, June 30, 1924.....

3,566,124.41

<sup>2</sup> Contra.

## Status of current accounts receivable as of June 30, 1924

	Due		Collected				Un- collected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges <sup>1</sup>	\$289,236.90	\$452,866.70	\$31,914.23	\$425,758.16	\$47.42	\$266.57	\$33,841.97
Charges paid in advance			54,574.47	54,962.83			
Operation and maintenance:							
Water-right charges, irrigation districts (approximately 76,591 acres) <sup>1</sup>	\$345,290.44	525,572.83	52,919.53	460,570.53	\$3,075.82	9,376.82	55,625.49
Penalties and interest			787.58	16,345.42	14,001.33	14,089.90	1,950.25
Charges paid in advance			54,252.84	54,292.57			
Revenues:							
Rentals of irrigating water	304.72	5,364.82	286.92	5,197.02	17.80	17.80	150.00
Rentals, grazing and farming lands	323.17	641.94	319.17	637.94			4.00
Subtotal	627.89	6,006.76	606.09	5,834.96	17.80	17.80	154.00
Miscellaneous uncollected							\$311.90
Other collections (reclamation fund):							
Construction forfeitures				1,116.10			
Construction penalties			\$1,264.56	12,164.54			
Construction refunds				423.42			
Operation and maintenance refunds				364.97			
Miscellaneous			1,864.83	49,618.26			
Grand total collections			5,987.99	1,084,471.78			

<sup>1</sup> Adjustments on account of contract with irrigation district.<sup>2</sup> Contra.

Uncollected construction water-right charges as of June 30, 1924, 7.4 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 10.6 per cent of total accruals.

## STRAWBERRY VALLEY PROJECT, UTAH

## Appropriations:

## Fiscal year 1924—

Congressional authorizations	\$92,858.06
Disbursements	\$37,920.28
Liabilities outstanding	1,426.83
	39,345.56

Unencumbered balance June 30, 1924

Fiscal year 1925, amount specified in appropriation act

## Investment

	Reclamation fund	Judgments, Court of Claims	Increase of compensa- tion (net)	Total
Disbursements and net transfers	\$4,191,861.51	\$440.00	\$34,495.26	\$4,226,796.77
Less collections	1,288,559.51			1,288,559.51
Net investment June 30, 1924	2,903,302.00	440.00	34,495.26	2,938,237.26

	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction <sup>1</sup> .....		\$3,491,237.58
Operation and maintenance prior to public notice (net).....		12,111.90
		<u>\$3,503,349.48</u>
<b>Less: Construction revenues</b> .....	\$8,393.52	44,775.00
<b>To be repaid by water users</b> .....	<sup>2</sup> 8,393.52	<u>2,458,574.48</u>
<b>Repayment:</b>		
Water-right contracts (individual).....	7,156.33	2,441,725.70
Water-right contracts (Warren Act).....		83,700.00
Contracts, Springville and Mapleton irrigation districts.....		460,650.08
Special contracts.....		106,180.00
<b>Total</b> .....	<b>7,156.33</b>	<b>3,091,255.70</b>

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
<b>Operation and maintenance cost</b> .....	\$21,428.79	\$373,277.38	\$22,770.51	\$335,536.40
<b>To repay operation and maintenance cost:</b>				
Charges contracted.....	94,128.43	371,265.62	18,422.00	370,186.62
Penalties.....	1,230.06	3,472.21	1,122.59	3,062.84
Discounts (contra).....	1,284.86	9,279.89	1,218.76	9,572.85
Miscellaneous revenues.....	336.27	10,662.82	608.36	11,121.69
<b>Total</b> .....	<b>94,409.90</b>	<b>376,140.76</b>	<b>18,961.79</b>	<b>375,643.21</b>
<b>Results:</b>				
Excess.....	72,981.11	2,863.38		
Deficit.....			3,818.72	2,880.19

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....	\$2,458,574.48
Plus: Miscellaneous revenues to June 30, 1923.....	\$38,381.48
Less: Operation and maintenance prior to public notice June 30, 1923 (net).....	12,111.90
	<u>24,269.56</u>
Construction cost to June 30, 1923.....	1,491,237.58
Construction cost to June 30, 1924.....	<u>1,491,237.58</u>

<sup>2</sup> Contra.

## Status of current accounts receivable as of June 30, 1924

	Due		Collected				Uncollected June 30, 1924
			Cash		Other credits		
	Fiscal year 1924	June 30, 1924	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$123,553.90	\$609,899.37	\$83,399.85	\$479,796.61			\$130,102.76
Charges paid in advance			175.41	10.71			
Operation and maintenance:							
Water-right charges project lands (31,974.43 acres)	34,464.83	273,742.61	24,707.34	228,928.55	863.89	8,512.73	36,301.33
Warren Act lands (approximately 2,740.65 acres)	769.44	5,982.35	261.77	5,016.61	12.27	181.24	784.50
Irrigation districts (approximately 10,000 acres)	5,745.00	32,991.26	5,457.75	32,344.94	287.25	646.31	
Other lands (approximately 2,835 acres)	1,107.00	6,507.25	1,051.65	6,274.68	55.35	232.57	
Total	42,086.27	319,223.46	31,578.51	272,564.78	1,218.76	9,572.85	37,085.83
Penalties and interest			1,129.59	3,918.84			
Charges paid in advance			4.32	4.36			
Revenues:							
Rentals of irrigating water	175.25	8,563.64	175.25	8,563.64			
Rentals of power and light	24,480.76	151,569.65	24,751.30	149,961.72			1,547.93
Rentals of grazing and farming lands	15,494.20	151,280.36	15,499.20	151,280.36			
Subtotal	40,150.21	311,353.65	40,425.75	309,805.72			1,547.93
Miscellaneous uncollected							87.13
Other collections (reclamation fund):							
Construction forfeitures				20.00			
Construction penalties			3,366.64	9,746.24			
Operation and maintenance refunds				36.48			
Miscellaneous			500.51	212,655.77			
Grand total collections			100,238.76	1,298,559.51			

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1924, 21.3 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 11.6 per cent of total accruals.

## SKANOGAN PROJECT, WASHINGTON

## Appropriations:

## Fiscal year 1924—

Congressional authorizations	\$69,814.56
Disbursements	\$51,364.69
Liabilities outstanding	5,429.31

56,794.00

Unencumbered balance June 30, 1924

13,020.56

Fiscal year 1925, amount specified in appropriation act

70,000.00

## Investment

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,835,543.33	\$47,757.41	\$1,883,300.74
Less collections.....	488,293.31		488,293.31
Net investment June 30, 1924.....	1,347,250.02	47,757.41	1,395,007.43

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....		\$941,536.61
Supplemental construction.....	\$10,335.16	608,012.03
Total construction cost <sup>1</sup> .....	10,335.16	1,449,548.64
Operation and maintenance prior to public notice (net).....	1,643.97	47,760.87
Operation and maintenance arrearages being repaid with construction.....		9,746.79
Less:		\$1,411,528.56
Construction revenues.....	\$100.32	6,708.70
To be repaid by water users.....	12,079.45	1,405,819.86
Repayment:		
Water-right contracts (individual).....	\$1,235.00	2,395.00
Contract, Okanogan irrigation district.....	496.00	1,404,445.29
Total.....	\$1,739.00	1,406,840.29

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$46,558.88	\$387,565.26	\$47,410.98	\$411,863.92
To repay operation and maintenance cost:				
Charges contracted.....	53,551.25	311,892.49	52,884.75	311,226.99
Penalties.....	1,733.52	7,447.37	2,683.59	8,826.10
Discounts (contra).....		359.03		359.03
Miscellaneous revenues.....	888.68	67,553.38	1,006.62	68,079.43
Other credits: Operation and maintenance arrearages being repaid with construction.....		9,746.79		9,746.79
Total.....	56,173.45	396,281.00	56,524.87	397,519.28
Results:				
Excess.....	10,614.47	8,715.74	9,113.89	
Deficit.....				14,344.64

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$1,393,740.41

Plus:

Miscellaneous revenues to June 30, 1923.....	\$5,800.02
Operation and maintenance prior to public notice, June 30, 1923 (net).....	49,410.84
	55,210.86

Less: Operation and maintenance arrearages, June 30, 1923..... 1,448,980.27

9,746.79

Construction cost to June 30, 1923..... 1,439,213.48

Actual cost, fiscal year 1924..... 10,335.16

Construction cost to June 30, 1924..... 1,449,548.64

<sup>2</sup> Contra.

## Status of current accounts receivable as of June 30, 1924

	Due		Collected			Uncollected 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924	
			Fiscal year 1924	To June 30, 1924		
Construction:						
Water-right charges	\$10,849.35	\$67,044.08	\$9,456.77	\$63,738.15		\$3,305.93
Charges paid in advance			19.13	137.19		
Operation and maintenance:						
Water-right charges						
Project lands (6729 acres)	62,555.97	283,523.50	49,774.14	264,408.47	2,614.61	16,500.42
Penalties and interest			2,633.50	8,247.74	578.36	
Revenues:						
Rentals of irrigating water	1,206.37	109,244.48		108,222.69	2,584.19	437.60
Rentals of power and light		1,754.71		1,754.71		
Rentals of grazing and farm lands	50.00	772.50	50.00	772.50		
Subtotal	1,156.37	111,771.69	50.00	108,749.90	2,584.19	437.60
Miscellaneous uncollected						1,385.65
Other collections (reclamation fund):						
Construction forfeitures			97.50	97.50		
Construction penalties			539.06	1,775.14		
Construction refunds				75.20		
Operation and maintenance refunds				52.50		
Miscellaneous			1,620.90	41,011.52		
Grand total collections			64,162.74	488,209.31		

## Contra.

Uncollected construction water rights charges as of June 30, 1924, 4.9 per cent of total accruals.

Uncollected Operation and Maintenance charges as of June 30, 1924 5.8 per cent of total accruals.

## YAKIMA PROJECT, WASHINGTON

## Appropriations:

Fiscal year 1924—

Congressional authorizations.....		\$1,312,489.18
Disbursements.....	\$1,061,432.34	1
Liabilities outstanding.....	206,189.94	

Unencumbered balance, June 30, 1924..... 1,266,592.28

Fiscal year 1925, amount specified in appropriation act..... 46,896.90

720,000.00

## Investment

	Reclamation fund	Judgments Court of claims	Increase of compensation-(net)	Total
Disbursements and net transfers.....	\$16,404,590.08	\$71,999.46	\$284,971.60	\$16,761,561.14
Less collections.....	6,674,865.09			6,674,865.09
Net investment June 30, 1924.....	9,729,724.99	71,999.46	284,971.60	10,086,696.05



	Fiscal year 1924	To June 30, 1924
<b>Irrigation works:</b>		
Original construction.....	\$1, 114, 578. 51	\$13, 437, 263. 32
Supplemental construction.....	12, 160. 02	125, 170. 41
Value of works taken over.....		29, 761. 29
Total construction cost.....	<sup>1</sup> 1, 126, 738. 53	\$13, 592, 195. 02
Operation and maintenance prior to public notice (net).....		<sup>2</sup> 63, 957. 96
Operation and maintenance arrearages being repaid with construction.....	<sup>3</sup> 45. 02	77, 262. 88
Less:		13, 605, 499. 94
Contributed funds.....		63, 736. 50
Construction revenues.....	9, 838. 53	254, 133. 12
		317, 869. 62
To be repaid by water users.....	1, 116, 854. 98	13, 267, 630. 32
<b>Repayment:</b>		
Water-right contracts (Individuals).....	242. 99	3, 434, 322. 16
Water-right contracts (Warren Act).....	8, 984. 32	1, 023, 329. 61
Irrigation district contracts.....	9, 899. 00	2, 085, 065. 68
Special contracts.....		2, 279, 600. 00
Total.....	19, 116. 21	9, 668, 388. 45

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$272, 790. 30	\$2, 534, 236. 68	\$283, 537. 84	\$2, 060, 876. 86
To repay operation and maintenance cost:				
Charges contracted.....	264, 914. 02	2, 396, 564. 41	260, 721. 36	2, 465, 487. 24
Penalties.....	6, 762. 09	37, 804. 25	3, 768. 63	38, 461. 57
Discounts (contra).....	2, 771. 53	28, 714. 21	3, 523. 01	31, 548. 29
Miscellaneous revenues.....	6, 833. 84	88, 216. 92	6, 561. 41	92, 583. 91
Other credits: Operation and maintenance arrearages being repaid with construction.....	738. 02	77, 307. 90	<sup>1</sup> 45. 02	77, 262. 88
Total.....	\$76, 476. 44	\$2, 571, 179. 27	267, 483. 37	2, 642, 247. 31
<b>Results:</b>				
Excess.....	3, 686. 14	36, 942. 50		
Deficit.....			16, 054. 47	18, 629. 55

<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report..... \$12, 289, 239. 57

Plus:

Miscellaneous revenues to June 30, 1923.....	\$244, 294. 59
Cost adjustments and undistributed clearing accounts June 30, 1923.....	<sup>2</sup> 4, 727. 73

12, 478, 906. 43

Less:

Operation and maintenance arrearages, June 30, 1923.....	77, 307. 90
Operation and maintenance prior to public notice June 30, 1923.....	<sup>2</sup> 63, 957. 96

13, 349. 94

Construction cost of June 30, 1923.....	12, 465, 456. 49
Actual cost, fiscal year 1924.....	1, 126, 738. 53

Construction cost to June 30, 1924.....	13, 592, 195. 02
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<sup>2</sup> Contra.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$344, 498. 03	\$3, 629, 798. 29	\$357, 247. 36	\$3, 432, 978. 49		\$28, 715. 95	\$168, 103. 84
Contributed funds		63, 736. 50		63, 736. 50			
Total	344, 498. 03	3, 693, 534. 78	357, 247. 36	3, 496, 714. 99		28, 715. 95	168, 103. 84
Charges paid in advance			3, 805. 97	7, 197. 51			
Operation and maintenance:							
Water-right charges, project lands (31,995 acres)	89, 276. 50	744, 021. 68	70, 566. 68	659, 992. 14	\$1, 979. 38	16, 700. 37	67, 329. 17
Warren Act lands (approximately 52,572 acres)	29, 490. 20	175, 022. 92	28, 917. 15	165, 667. 55	8. 11	9. 42	9, 345. 95
Irrigation districts (approximately 67,548 acres)	123, 599. 22	1, 453, 514. 24	119, 729. 26	1, 376, 750. 46	1, 535. 52	15, 883. 84	60, 870. 94
Other lands (approximately 84,611 acres)	18, 355. 44	92, 928. 40	11, 265. 44	85, 838. 40			7, 090. 00
Total	260, 721. 36	2, 465, 487. 24	230, 478. 53	2, 288, 257. 55	3, 523. 01	32, 593. 63	114, 635. 06
Penalties and interest			3, 768. 63	38, 461. 57			
Charges paid in advance			146. 04	122. 75			
Revenues:							
Rentals of irrigating water	3, 296. 76	143, 885. 72	2, 771. 31	142, 746. 44			1, 140. 28
Rentals of power and light		3, 635. 33		3, 635. 33			
Rentals of grazing lands	1, 781. 46	23, 061. 51	1, 617. 56	22, 652. 30			409. 20
Subtotal	5, 078. 22	170, 582. 55	4, 388. 87	169, 033. 07			1, 549. 48
Miscellaneous uncollected							1, 043. 11
Other collections (reclamation fund):							
Construction forfeitures			54. 40	1, 057. 62			
Construction penalties			8, 726. 57	60, 993. 37			
Construction refunds				2, 833. 62			
Operation and maintenance refunds				1, 045. 65			
Miscellaneous			47, 879. 57	609, 146. 39			
Grand total collections			656, 303. 86	6, 674, 865. 09			

<sup>1</sup> Contra.

Uncollected construction water right charges as of June 30, 1924, 4.6 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 5.9 per cent of total accruals.

## RIVERTON PROJECT, WYOMING

## Appropriations:

Fiscal year 1924—		
Congressional authorizations.....		\$679, 053. 56
Disbursements.....	\$821, 353. 36	
Liabilities outstanding.....	54, 944. 07	
		676, 297. 43
Unencumbered balance June 30, 1924.....		2, 756. 13
Fiscal year 1925, amount specified in appropriation act.....		650, 000. 00

## Investment

	Reclamation fund	Wind River ceded lands (Indian)	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1, 687, 808. 78	\$359, 176. 04	\$44, 955. 95	\$2, 091, 940. 77
Less collections.....	33, 828. 47			33, 828. 47
Net investment June 30, 1924.....	1, 653, 980. 31	359, 176. 04	44, 955. 95	2, 058, 112. 30

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction <sup>1</sup> .....	\$600, 061. 75	\$1, 679, 989. 87
Operation and maintenance prior to public notice (net).....	<sup>2</sup> 111. 75	<sup>2</sup> 111. 75
Less construction revenues.....	1, 895. 29	
To be repaid by water users.....	598, 054. 71	
		\$1, 679, 878. 12
		6, 599. 86
		1, 673, 278. 26
<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....		\$1, 060, 228. 09
Plus:		
Miscellaneous revenues to June 30, 1923.....		\$4, 704. 57
Cost adjustments and undistributed clearing accounts, June 30, 1923.....		14, 995. 46
		19, 700. 03
Construction cost to June 30, 1923.....		1, 079, 928. 12
Actual cost, fiscal year 1924.....		600, 061. 75
Construction cost to June 30, 1924.....		1, 679, 989. 87
<sup>2</sup> Contra.		

## Status of current accounts receivable as of June 30, 1924

	Due		Collected		Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Rentals of irrigating water.....	\$111. 75	\$111. 75	\$111. 75	\$111. 75	
Miscellaneous uncollected.....					\$1, 462. 43
Other collections (reclamation fund): Miscellaneous.....			6, 237. 70	33, 716. 72	
Grand total collections.....			6, 349. 45	33, 828. 47	

## SHOSHONE PROJECT, WYOMING

## Appropriations:

## Fiscal year 1924—

Congressional authorizations.....		\$396,440.75
Disbursements.....	\$399,285.77	
Liabilities outstanding.....	48,328.44	
		447,614.21

Unencumbered balance June 30, 1924.....		448,828.54
Fiscal year 1925, amount specified in appropriation act.....		475,000.00

## Investment

	Reclamation fund	Judgments Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$9,477,645.74	\$322,164.67	\$162,839.98	\$9,962,650.39
Less collections.....	1,327,018.27			1,327,018.27
Net investment June 30, 1924.....	8,150,627.47	322,164.67	162,839.98	8,635,632.12

	Fiscal year 1924	To June 30, 1924
Irrigation works:		
Original construction.....	\$136,182.00	\$7,424,013.10
Supplemental construction.....	474,292.34	1,548,075.26
Total construction cost <sup>1</sup> .....	610,474.34	8,972,088.36
Operation and maintenance prior to public notice.....		21,398.67
Operation and maintenance arrearages being repaid with construction.....		147.75
		\$8,993,634.78
Less:		
Contributed funds.....		1,000.00
Construction revenues.....	4,388.07	76,008.49
		77,008.49
To be repaid by water users.....	606,086.27	8,916,626.29
Repayment: Water-right contracts (individual).....	312,085.73	5,902,575.16
<sup>1</sup> Reconciliation: Net cost to date, twenty-second annual report.....		\$8,291,013.17
Plus:		
Miscellaneous revenues to June 30, 1923.....		\$71,620.42
Cost adjustments and undistributed clearing accounts, June 30, 1923.....		20,526.85
		92,147.27
		8,383,160.44
Less:		
Operation and maintenance arrearages, June 30, 1923.....		147.75
Operation and maintenance prior to public notice, June 30, 1923 (net)....		21,398.67
		21,546.42
Construction cost to June 30, 1923.....		8,361,614.02
Actual cost, fiscal year 1923.....		610,474.34
Construction cost to June 30, 1924.....		8,972,088.36

	Calendar year 1923	To Dec. 31, 1923	Fiscal year 1924	To June 30, 1924
Operation and maintenance cost.....	\$57,371.90	\$657,668.10	\$54,532.76	\$685,107.26
To repay operation and maintenance cost:				
Charges contracted.....	61,641.89	671,149.56	62,184.83	670,297.76
Penalties.....	2,105.16	9,545.72	1,315.77	10,178.31
Discounts (contra).....	326.41	10,112.15	478.09	10,343.65
Miscellaneous revenues.....	871.29	14,662.31	5,955.63	20,182.22
Other credits: Operation and maintenance arrearages being repaid with construction.....		147.75		147.75
Total.....	64,291.93	685,393.19	68,978.14	690,462.39
Results: Excess.....	6,920.05	27,725.09	14,445.38	5,355.13

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*Status of current accounts receivable as of June 30, 1924*

	Due		Collected				Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits		
			Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924	
Construction:							
Water-right charges	\$112,579.30	\$913,782.66	\$14,743.89	\$624,641.94	\$1,317.18	\$1,835.85	\$287,304.87
Contributed funds		1,000.00		1,000.00			
Total	112,579.30	914,782.66	14,743.89	625,641.94	1,317.18	1,835.85	287,304.87
Charges paid in advance			416.27	608.05			
Operation and maintenance:							
Water-right charges, project lands (64,457.17 acres)	62,184.83	676,297.76	16,330.66	421,391.31	3,946.26	18,597.12	230,309.33
Penalties and interest			777.08	7,822.62	538.69	2,355.69	
Charges paid in advance			69.93	338.50	97.17	101.00	
Revenues:							
Rentals of irrigating water	5,282.47	17,648.52	5,394.57	17,508.47			140.05
Rentals of power and light	8,114.63	14,637.34	7,944.24	13,969.44			667.90
Rentals of grazing and farming lands	1,121.37	9,589.61	1,272.27	9,379.61			210.00
Subtotal	14,518.37	41,875.47	14,611.08	40,857.52			1,017.95
Miscellaneous uncollected							39,192.94
Other collections (reclamation fund):							
Construction forfeitures			1,844.10	6,760.30			
Construction penalties			1,020.20	9,231.43			
Construction refunds			282.75	2,583.34			
Operation and maintenance refunds				409.45			
Miscellaneous			5,157.39	211,373.81			
Grand total collections			55,253.35	1,327,018.27			

Uncollected construction water-right charges as of June 30, 1924, 31.4 per cent of total accruals.

Uncollected operation and maintenance charges as of June 30, 1924, 34.4 per cent of total accruals.

## SECONDARY PROJECT INVESTIGATIONS

### BAKER

#### Appropriations:

##### Fiscal year 1924—

Congressional authorizations ..... \$500,394.32

Disbursements ..... 4,459.28

Unencumbered balance June 30, 1924 ..... 495,935.04

Fiscal year 1925, amount specified in appropriation act ..... 485,985.04

### OTHERS

#### Appropriations:

##### Fiscal year 1924—

Congressional authorizations <sup>1</sup> ..... \$292,473.22

Disbursements <sup>1</sup> ..... \$128,628.57

Liabilities outstanding ..... 4,943.82

Unencumbered balance June 30, 1924 ..... 133,572.39

Fiscal year 1925, amount specified in appropriation act ..... 158,900.83

Fiscal year 1925, amount specified in appropriation act ..... 75,000.00

<sup>1</sup> The appropriation act authorizes the expenditure by Baker in fiscal year 1925 of the unexpended balance of the appropriation for the fiscal year 1924.

<sup>2</sup> \$25,969.22 of this amount also included in statement of appropriation for general investigations, Reclamation Service, 1923-Dec. 31, 1924. (\$26,500, funds advanced deposited to credit of reclamation fund, and \$369.22 increase of compensation appropriation.)

<sup>3</sup> \$5,120.16 of this amount also included in statement of expenditures in connection with appropriation general investigations, Reclamation Service, 1923-Dec. 31, 1924. (\$4,750.94, reclamation fund, and \$369.22 increase of compensation.)

	Baker		Deschutes to June 30, 1924	Other investigations		Total	
	Fiscal year 1924	To June 30, 1924		Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Cost of investigations.....	\$4,506.27	\$57,945.36	\$8,360.96	\$129,485.39	\$2,060,642.17	\$133,991.66	\$2,135,948.49
Less contributed funds.....	-----	5,000.00	-----	12,291.47	470,783.46	12,291.47	475,783.46
Cost to United States.....	4,506.27	52,945.36	8,360.96	117,193.92	1,589,858.71	121,700.19	1,660,165.03
Investment:							
Reclamation fund, disbursements and net transfers.....	3,643.66	52,686.68	894.85	128,551.90	2,038,929.65	132,195.56	2,092,511.18
Increase of compensation (net).....	85.06	1,442.00	43.01	5,852.76	39,779.56	5,937.81	41,264.57
Less collections.....	3,728.71	54,128.68	937.86	134,404.66	2,078,709.21	138,133.37	2,133,775.75
	203.55	879.29	.15	38,275.87	612,628.62	38,479.42	613,508.06
Net investment June 30, 1924.....	3,525.16	53,249.39	937.71	96,128.79	1,466,060.59	99,653.95	1,520,267.69

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected			Uncollected June 30, 1924
	Fiscal year 1924	To June 30, 1924	Cash		Other credits to June 30, 1924	
			Fiscal year 1924	To June 30, 1924		
Contributed funds:						
Baker.....		\$5,000. 00		\$5,000. 00		
Other secondary investi- gations.....	\$12, 291. 47	470, 783. 46	\$13, 042. 42	438, 190. 12		\$32, 593. 34
Revenues from rentals of graz- ing and farming lands:						
Deschutes.....		7, 407. 29			\$7, 407. 29	
Other secondary investi- gations.....	9, 004. 82	155, 619. 70	9, 472. 58	119, 538. 35	35, 090. 38	990. 97
Miscellaneous uncollected.....						468. 17
Miscellaneous:						
Baker.....			203. 55	879. 29		
Other secondary investi- gations.....			15, 760. 87	49, 900. 15		
Deschutes.....				. 15		
Grand total collections.....			38, 479. 42	613, 508. 06		

*Costs of secondary project investigations and funds contributed for these investigations*

Features	Cost, fiscal year 1924	Total to June 30, 1924	Contributed funds
Arizona:			
Arizona well drilling.....	-----	\$3,069.63	\$1,446.01
Arizona cooperative.....	-----	20,295.17	13,714.42
Parker.....	-----	517.91	-----
San Carlos distribution.....	-----	8,638.54	8,638.54
Little Colorado.....	-----	9,554.33	-----
San Carlos.....	-----	24,829.51	-----
San Pedro.....	-----	2,427.34	-----
Paradise Verde.....	-----	929.14	929.14
Colorado River diversions.....	\$233.80	1,957.23	-----
Total Arizona.....	233.80	72,218.80	24,728.11
Arizona-California:			
Boulder Canyon Reservoir.....	43,193.36	325,354.81	141,000.00
Colorado River Basin.....	7.45	166,153.79	-----
Colorado River (prior to July 1, 1914).....	-----	43,710.00	-----
Total Arizona-California.....	43,200.81	535,218.60	141,000.00

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## Costs of secondary project investigations and funds contributed for these investigations—Continued

Features	Cost, fiscal year 1924	Total to June 30, 1924	Contributed funds
<b>California:</b>			
Owens Valley.....		\$18,232.01	\$18,232.01
Imperial Laguna.....		1,543.81	1,543.81
Iron Canyon.....		36,806.00	18,550.73
Imperial Valley.....		2,794.04	
Jess Valley.....		3,805.74	1,901.01
Kings River storage.....		1,157.70	
Lassen County.....		2,445.60	1,222.80
Turlock-Modesto.....		278.97	
Oakdale-So. San Joaquin.....		1,079.16	
Putah Creek.....		211.32	
Pitt River cooperative.....		2,499.18	
Sacramento Valley.....		43,620.72	
San Joaquin.....		3,531.20	
San Luis Rey.....		696.53	
San Ysidro.....		7.50	
Shasta County cooperative.....		5,645.75	2,297.38
Warners Ranch Reservoir.....		5,378.35	5,378.35
Woodbridge.....		180.47	
Owens Valley cooperative.....		12,061.92	
California power investigations.....	\$3,429.50	3,429.50	320.78
Imperial Valley cooperative.....	4.16	39,018.65	26,009.66
Stoney Gorge Reservoir.....	7,823.00	7,823.00	
<b>Total California.....</b>	<b>11,256.66</b>	<b>192,249.12</b>	<b>75,456.53</b>
<b>California-Oregon: Shasta Valley.....</b>		<b>36,649.14</b>	<b>31,649.14</b>
<b>Colorado:</b>			
Dolores.....		4,256.27	
White River.....		4,337.00	
Little Snake River.....		951.43	
Montezuma.....		4,918.10	
San Luis Valley.....		4,318.01	
Upper White River.....	6,282.27	6,282.27	
San Juan Basin.....	267.48	267.48	
<b>Total Colorado.....</b>	<b>6,549.75</b>	<b>25,350.56</b>	
<b>Colorado-Utah: Lower White River.....</b>	<b>2,134.25</b>	<b>13,475.08</b>	<b>7,000.00</b>
<b>Idaho:</b>			
Idaho investigations.....		1,327.25	
Island Park.....		4,774.53	
Mountain Home.....		5,978.57	
Mountain Home cooperative.....	213.45	15,547.70	7,773.85
Swan Valley.....		544.88	
Dubois.....		17,252.06	
Dubois cooperative.....	9,425.81	17,260.68	4,055.53
Port Neuf.....		2,168.01	
General investigations.....		1,191.78	
Weiser River storage.....		918.96	
Wood River.....		168.96	
Succor Creek.....		2,392.67	
<b>Total Idaho.....</b>	<b>9,639.26</b>	<b>69,526.04</b>	<b>11,829.38</b>
<b>Montana:</b>			
Clarks Fork (old ledger).....		5,581.23	
Crow Reservation.....		18,911.96	
Judith Basin.....		2,891.42	2,891.42
Lake Basin.....		7,103.26	
Bitter Root.....		2,719.64	
Madison River.....		10,729.09	
Marias.....		13,546.39	
Missoula-Huson.....		3,086.33	
Toston, vicinity of.....		544.58	
Kalispell.....		73.29	73.29
Clarks Fork.....		3,666.95	
Tally Lake.....		2,544.21	2,544.21
Cut Bank.....		1,863.01	1,863.01
Camas.....	1.65	100.00	100.00
Blackfoot water supply.....	966.75	966.75	2,500.00
<b>Total Montana.....</b>	<b>966.10</b>	<b>74,348.11</b>	<b>9,971.68</b>
<b>Montana-North Dakota: Surveys.....</b>		<b>9,296.90</b>	

<sup>1</sup> Transferred from Orland project.

<sup>2</sup> Credit.

*Costs of secondary project investigations and funds contributed for these investigations—Continued*

Features	Cost, fiscal year 1924	Total to June 30, 1924	Contributed funds
<b>Nebraska:</b>			
Tri-County .....		\$8,381.70	\$5,000.00
South Platte .....		2,877.01	
Lower Platte .....		23,844.61	15,400.00
Total Nebraska .....		35,103.32	20,400.00
<b>Nevada:</b>			
Humboldt River .....		722.55	
Walker River .....		13,696.37	
Upper Owyhee .....		292.08	292.08
Total Nevada .....		14,711.00	292.08
<b>New Mexico:</b>			
Middle Rio Grande .....		4,130.07	
La Plata .....		28,064.33	
Las Vegas .....		5,014.09	
Upton Lake .....		17,464.70	
Pecos Valley .....	\$1,088.42	12,706.24	5,700.00
Penasco .....	3,136.57	5,798.12	
Middle Rio Grande cooperative .....		5,766.45	5,766.45
Total New Mexico .....	4,224.99	78,944.00	11,466.45
<b>North Dakota:</b>			
Bismark .....		13,621.69	
Bowman .....		4,025.03	
Little Missouri .....		11,933.52	
Washburn .....		10,532.73	
Nesson .....		17,471.83	
Total North Dakota .....		57,584.80	
<b>Oklahoma:</b>			
Lawton .....		13,774.82	
Turkey Creek .....		137.30	
Cimarron .....		8,891.17	
Oklahoma reconnaissance .....		400.00	
Red River .....		60,209.27	
Total Oklahoma .....		83,412.58	
<b>Oregon:</b>			
Central Oregon .....		39,128.82	
Columbia River cooperative .....		17,008.51	
John Day .....		16,009.57	
Deschutes .....		22,893.15	17,896.88
Harney .....		1,046.62	
Klamath River investigations .....		347.39	
Malheur .....		88,472.72	14,724.61
Ochoco-Crooked River .....		3,570.30	4,307.09
Malheur (cooperative) .....	2,889.11	7,110.89	5,000.00
Owyhee (Oregon cooperative) .....		1,615.74	
Owyhee (Oregon secondary) .....		1,267.29	
Owyhee (cooperative) .....		8,709.22	4,354.61
Rogue River .....		1,426.96	942.07
Silver Creek .....		334.23	
Silver Lake .....		3,407.03	775.91
Warner Valley .....		1,181.85	
White River .....		97.03	
Willamette Valley .....		378.20	
Teel District .....		456.35	
General investigations .....		226.43	
Baker .....	4,506.27	57,945.36	5,000.00
Deschutes .....		8,360.96	
Total Oregon .....	7,395.38	280,994.62	53,001.17
<b>South Dakota: Angostum .....</b>		6,874.31	3,542.61
<b>Texas:</b>			
Cotulla .....		110.00	
Lower Rio Grande (irrigation) .....		32,568.81	15,394.44
Lower Rio Grande (flood control) .....		12,543.12	12,543.12
Pecos River Survey .....		7,120.71	
Lower Rio Grande (irrigation districts) .....		558.49	558.49
Red Bluff Reservoir .....	74.32	5,500.00	5,500.00
Lower Rio Grande associated improvement districts .....		5,506.79	5,506.79
Total Texas .....	74.32	63,937.92	39,502.84



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## Costs of secondary project investigations and funds contributed for these investigations—Continued

Features	Cost, fiscal year 1924	Total to June 30, 1924	Contributed funds
<b>Utah:</b>			
Castle Peak.....	\$57. 00	\$24, 851. 13	\$999. 45
Dixie Reservoir.....		863. 52	
Utah reconnaissance.....		632. 59	
Mammoth Reservoir.....		404. 27	
Price River.....		17. 73	
Price River (1923-24).....		127. 67	
Green River water-right investigations.....		252. 74	
Bear Lake.....		18, 827. 72	
Provo-Weber.....		141. 35	
Utah Lake.....		24, 049. 30	
Juab investigations.....		4, 196. 68	4, 196. 68
Green River (cooperative).....		10, 494. 18	5, 247. 09
Salt Lake Basin.....	32, 383. 94	63, 436. 96	30, 500. 00
Cashe Valley.....	6, 912. 00	7, 246. 26	5, 000. 00
Transmountain diversions.....	1, 963. 67	3, 555. 02	
Spanish Fork-Lehi drainage.....	400. 00	500. 91	
<b>Total Utah.....</b>	<b>41, 736. 61</b>	<b>169, 598. 03</b>	<b>45, 942. 22</b>
<b>Washington:</b>			
Benton.....		11, 167. 45	
Columbia River Basin.....		5, 687. 02	
Kittitas.....		19, 366. 90	
Lower Snake River—Pasco.....		2, 099. 49	
Methow-Okanogan.....		192. 14	
Palouse.....		76, 409. 01	
Palouse cooperative.....		10, 201. 92	
Wapato.....		36, 465. 77	
Priest Rapids.....		6, 216. 01	
Columbia River power investigations.....		4, 042. 95	
Snahe and Columbia River.....		82. 81	
<b>Total Washington.....</b>		<b>171, 931. 47</b>	
<b>Wyoming:</b>			
Pathfinder pumping.....		1, 566. 96	
Church Butte.....		1, 442. 28	
DeSmet.....		8, 917. 38	
Fifteen-Mile.....		125. 06	
Green River.....		320. 15	
Lyman.....		2, 477. 77	
North Platte cooperative.....		5, 868. 66	
Wyoming cooperative.....		3, 681. 76	
Saratoga-Encampment.....		4, 883. 61	
General investigations.....		2, 073. 34	
Alcova-Casper.....		4, 809. 77	
<b>Total Wyoming.....</b>		<b>36, 168. 74</b>	
<b>Miscellaneous:</b>			
General reconnaissance.....		6, 182. 31	
Miscellaneous investigations.....	255. 76	9, 179. 85	
Preliminary investigations.....		80, 488. 73	
Experimental investigations.....	14, 224. 95	20, 425. 36	
<b>Total miscellaneous.....</b>	<b>14, 480. 71</b>	<b>116, 276. 35</b>	
Unadjusted clearing.....		17, 920. 98	
<b>Grand total secondary projects.....</b>	<b>141, 912. 64</b>	<b>2, 143, 869. 47</b>	<b>475, 782. 46</b>

<sup>1</sup> Contra.

### "GENERAL INVESTIGATIONS RECLAMATION SERVICE 1923, DECEMBER 31, 1924"

NOTE.—Financial data for this work are not included in the consolidated statements for reclamation fund projects, except that the consolidated statement of investment includes certain expenditures and collections which were in connection with the "General Investigations" work. The items which are included in both statements are as follows:

Reclamation fund disbursements.....	\$4, 750. 94
Increase of compensation disbursements.....	362. 22
	5, 113. 16
Reclamation fund collections.....	28, 500. 00
The collections represent "funds advanced" for investigations which are deposited to the credit of the reclamation fund and expended therefrom.	
<b>Appropriations:</b>	
Congressional authorizations.....	\$326, 368. 52
Disbursements.....	\$213, 632. 29
Liabilities outstanding.....	8, 331. 37
	221, 963. 66
Unencumbered balance June 30, 1924.....	104, 404. 86

*Costs of secondary project investigations and funds contributed for these investigations—Continued*

	Fiscal year 1924	To June 30, 1924
Cost of investigations.....	<sup>1</sup> \$187,247.36	\$187,247.36
Less contributed funds.....	25,500.00	25,500.00
Cost to United States.....	161,747.36	161,747.36
Investment:		
Disbursements—		
General investigations appropriation.....	185,782.14	202,190.38
Reclamation fund <sup>1</sup> .....	4,750.94	4,750.94
Increase of compensation (net)—		
In connection with general investigations fund.....	4,284.29	4,589.10
In connection with reclamations fund <sup>1</sup> .....	369.22	369.22
Total.....	195,186.59	211,899.64
Less collections—		
General investigations fund.....	19,177.55	19,177.55
Reclamation fund <sup>1</sup> .....	25,500.00	25,500.00
Total.....	44,677.55	44,677.55
Net investment June 30, 1924 (all funds).....	150,509.04	167,222.09

<sup>1</sup> Includes \$13,471.65 cost prior years.

<sup>2</sup> These figures also included in consolidated statement of investment for reclamation fund projects.

*Status of current accounts receivable as of June 30, 1924*

	Due		Collected cash	
	Fiscal year 1924	To June 30, 1924	Fiscal year 1924	To June 30, 1924
Contributed funds.....	\$25,500.00	\$25,500.00	\$25,500.00	\$25,500.00
Other collections.....			19,177.55	19,177.55
Grand total collections.....			44,677.55	44,677.55

*Cost of investigations and funds contributed for these investigations*

Features	Cost fiscal year 1924	Total to June 30, 1924	Contributed funds
Arizona-Nevada-Utah: Colorado River tributaries.....	\$5,092.26	\$5,092.26	
California:			
Sacramento Valley, salt water control.....	2,151.06	2,151.06	\$7,500.00
Sacramento Valley, Iron Canyon investigations.....	452.40	452.40	2,500.00
Total California.....	2,603.46	2,603.46	10,000.00
Colorado:			
Badito.....	606.37	606.37	
San Luis Valley.....	1,725.60	1,725.60	
Total Colorado.....	2,331.97	2,331.97	
Colorado-New Mexico: San Juan Basin.....	9,296.10	9,296.10	
Idaho: Black Canyon.....	9,928.30	9,928.30	
Nebraska: Tri-county.....	10,780.34	10,780.34	5,500.00
New Mexico: Estancia Valley.....	181.15	181.15	
New Mexico-Texas: Pecos Valley compact.....	3,048.67	3,048.67	
Oregon:			
Malheur.....	4,965.66	4,965.66	
Owyhee.....	9,133.05	9,133.05	
Total Oregon.....	14,098.71	14,098.71	
Oregon-Washington: Umatilla Rapids.....	52,668.63	52,668.63	10,000.00
Texas: Red Bluff Reservoir.....	6,670.44	6,670.44	
Washington:			
Columbia Basin.....	67,649.09	67,649.09	
Yakima extensions.....	2,898.24	2,898.24	
Total Washington.....	70,547.33	70,547.33	
Grand total.....	<sup>1</sup> 187,247.36	187,247.36	25,500.00

<sup>1</sup> Includes \$13,471.65 cost prior years.

# ENGINEERING DATA FOR PROJECTS ON COMPLETION

[The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canal, they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress.]

## Engineering data for projects when completed

### RESERVOIRS

Projects	Name	Area	Capacity	Spillways			
				Length	Elevation above stream bed	Capacity	
		<i>Acres</i>	<i>Acre-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Normal</i>	<i>Maximum</i>
Arizona: Salt River	Roosevelt	18,100	1,635,000	420	240	113,000	150,000
California: Orland	East Park	1,850	51,000	415	88	8,000	12,000
Colorado: Uncompahgre	Taylor Park	2,260	106,000	(1)	(1)	(1)	(1)
Idaho:							
Boise	Deer Flat	9,835	177,000	None.			
Do	Arrowrock	2,860	280,000	402	247	15,000	40,000
Minidoka	Lake Walcott	11,850	150,000	2,385	42	40,000	60,000
Do	Jackson Lake	25,540	847,000	160	41	7,500	13,000
Do	American Falls	56,500	1,700,000	648	75	60,000	115,000
Montana:							
Milk River	Sherburne Lakes	2,000	78,000	160	68	200	8,000
Do	St. Mary Lakes	6,910	124,000	500		20,500	20,000
Do	Nelson Reservoir	4,560	68,500	(2)	23		
Do	Point of Rocks	180	830	740	8	0	700
Do	Chain Lakes	9,400	244,000	300	58	3,300	10,000
Sun River	Willow Creek	2,696	86,000	200	100	725	(1)
Do	Beaver Creek	1,360	105,000	275	190		42,500
Do	Pishkun Reservoir	1,542	45,700	Under control.			
Do	Muddy Creek	1,828	33,000		80	294	(1)
Do	Benton Lake	9,300	144,000	Under control.			
Nebraska-Wyoming:							
North Platte	Pathfinder	22,700	1,070,000	605	184	40,000	
Do	Lake Alice	900	11,400	100	18	2,500	
Do	Lake Minature	2,240	60,760	100	55	2,000	
Do	Winters Creek Lake	360	3,000	None.			
Do	Guernsey	2,336	72,700	300	80	27,500	50,000
Nevada: Newlands	Lake Tahoe	120,000	120,000	85	6	2,500	
Do	Lahontan	10,000	290,000	500	112	18,800	30,000
Do	Spanish Springs	9,400	300,000	60	96	1,600	1,600
New Mexico: Carlsbad	Avalon	970	7,000	1,026	21	86,000	130,000
Do	McMillan	6,600	45,000	1,750	26.1-24.9	34,500	60,000
New Mexico-Texas: Rio Grande	Elephant Butte	40,080	2,638,000	275	193	8,000	16,000
Oregon: Umatilla	Cold Springs	1,500	50,000	330	90	6,000	6,000
Do	McKay	1,600	75,000	120	140	10,000	10,000
Oregon-California: Klamath	Upper Klamath Lake	60,000	400,000	None.			
Do	Clear Lake	25,000	462,000	357	24	10,000	30,000
Do	Gerber	3,700	60,000	150	63		10,000
South Dakota: Belle Fourche	Belle Fourche	8,010	203,000	314	100	2,000	2,000
Utah: Strawberry Valley	Strawberry Valley	8,370	255,000	58	61	500	2,000
Washington:							
Okanogan	Salmon Lake	240	10,500	Siphon.	48		400
Do	Conconully	460	14,400	180	58	4,500	16,000
Yakima	Bumping Lake	1,300	34,000	235	36		6,000
Do	Lake Clealum	4,680	501,000	420	112		18,000
Do	Lake Kachess	4,540	210,000	250	53		7,200
Do	Tieton	2,500	202,500	390	206		50,000
Do	Lake Keechelus	2,550	152,000	300	60		10,000
Do	Clear Creek	270	5,830	261	58		
Wyoming: Riverton	Pilot Butte	882	30,000	100			500
Do	Bull Lake	3,100	145,000	170	67	4,000	8,000
Shoshone	Shoshone	6,600	456,600	300	233	11,000	30,000
Do	Ralston	200	2,100				
Do	Deaver	80	680	None.			
Total		519,739	13,792,500				

<sup>1</sup> Undetermined.

<sup>2</sup> 95,180 acre-feet only available; above fixed crest of spillway.

<sup>3</sup> First construction may be for less capacity with provision for ultimate increase to amount stated.

<sup>4</sup> Average flow of stream on which reservoir is located.

<sup>5</sup> No spillways; drainage limited elevation is that of water surface.

<sup>6</sup> Consists of 8 siphons each 5 feet high and 10 feet wide at throat.

<sup>7</sup> Present capacity 16,700 acre-feet.

<sup>8</sup> Tentative.

<sup>9</sup> Present capacity 3,523 acre-feet.

## Engineering data for projects when completed—Continued

## STORAGE DAMS

Projects	Name	Type	Maximum height	Crest length	Volume
Arizona: Salt River	Roosevelt <sup>10</sup>	Rubble masonry arch, gravity.	Feet 280	Feet 1, 125	Cubic yds. 342, 325
California: Orland	East Park <sup>10</sup>	Concrete arch, gravity	139	250	12, 200
Colorado: Uncompahgre.	Taylor Park	Undetermined	(11)	(11)	(11)
Idaho:					
Boise	Upper Deer Flat <sup>10</sup>	Earth fill	70	4, 000	1, 190, 275
Do.	Lower Deer Flat <sup>10</sup>	do.	40	7, 200	1, 207, 606
Do.	Deer Flat Forest <sup>10</sup>	do.	16	950	22, 500
Do.	Arrowrock <sup>10</sup>	Rubble concrete arch, gravity.	349	1, 100	585, 130
Minidoka	Minidoka <sup>10</sup>	Rock fill, concrete core	86	937	242, 500
Do.	Jackson Lake <sup>10</sup>	Massive concrete gate section and earth fill.	67	4, 450	345, 400
Do.	American Falls	(Concrete gravity Earth fill)	<sup>12</sup> 87 75	3, 100 1, 900	170, 000 150, 000
Montana:					
Milk River	Sherburne Lakes <sup>12</sup>	Earth embankment	83	1, 133	201, 500
Do.	St. Mary Lakes	do.	30	2, 000	135, 000
Do.	Nelson <sup>10</sup>	do.	28	9, 900	175, 000
Do.	Point of Rocks <sup>10</sup>	do.	12, 5	2, 680	31, 000
Do.	Connolly	do.	68	3, 125	2, 019, 000
Sun River	Willow Creek <sup>14</sup>	Earth fill	110	1, 045	452, 080
Do.	Beaver Creek <sup>14</sup>	Masonry	205	820	195, 000
Do.	Plshkun <sup>10</sup>	Earth fill	48	8, 600	444, 000
Do.	Muddy Creek	do.	90	800	440, 000
Do.	Benton Lake	do.	40	240	12, 000
Nebraska-Wyoming:	Pathfinder <sup>10</sup>	Broken range masonry arch.	218	432	60, 210
North Platte.					
Do.	Pathfinder Dike <sup>10</sup>	Earth fill	40	1, 650	152, 000
Do.	Upper Lake Alice <sup>10</sup>	do.	30	3, 100	240, 000
Do.	Lower Lake Alice <sup>10</sup>	do.	23	2, 650	119, 000
Do.	Minatare <sup>10</sup>	do.	65	3, 700	570, 000
Do.	Guernsey	Earth and rock fill	97	575	332, 000
Nevada: Newlands	Lake Tahoe <sup>10</sup>	Concrete sluiceway regulator	14	109	425
Do.	Lahontan <sup>10</sup>	Earth and gravel fill with concrete spillways.	124	1, 400	770, 000
Do.	Spanish Springs	do.	112	2, 815	1, 700, 000
New Mexico:					
Carlsbad	Avalon <sup>10</sup>	Earth and rockfill, concrete core.	50	1, 380	168, 773
Do.	McMillan <sup>10</sup>	Earth and rock fill	55	2, 070	150, 744
New Mexico-Texas:	Elephant Butte <sup>10</sup>	Rubble concrete, gravity	306	<sup>10</sup> 1, 155	<sup>17</sup> 605, 200
Rio Grande.					
Do.	Elephant Butte Dike <sup>10</sup>	Earth and rock fill	42	2, 000	179, 000
Oregon: Umatilla	Cold Springs <sup>10</sup>	do.	98	3, 800	789, 500
Do.	McKay	Earth and gravel fill	160	2, 600	2, 300, 000
Oregon-California:	Clear Lake <sup>10</sup>	Rock fill	33	790	56, 600
Klamath.					
Do.	Link River <sup>10</sup>	Concrete	22	435	2, 200
Do.	Gerber	Concrete arch	85	470	9, 500
South Dakota: Belle Fourche.	Belle Fourche <sup>10</sup>	Earth fill	122	6, 200	1, 600, 000
Utah: Strawberry Valley.	Indian Creek Dike <sup>10</sup>	Earth fill, reinforced concrete	37	1, 311	101, 107
Do.	Strawberry Dam <sup>10</sup>	Earth fill, reinforced concrete core wall.	72	488	108, 415
Washington:					
Okanogan	Salmon Lake <sup>10</sup>	Earth embankment	40	1, 260	194, 288
Do.	Conconully <sup>10</sup>	Hydraulic earth fill	67	1, 000	354, 242
Yakima	Bumping Lake <sup>10</sup>	Earth fill	45	3, 425	247, 700
Do.	Lake Cle Elum <sup>10</sup>	Earth and gravel fill	125	700	462, 000
Do.	Lake Kachess <sup>10</sup>	do.	63	1, 400	193, 800
Do.	Tieton	Earth and rock fill, concrete-core wall.	244	905	1, 850, 000
Do.	Lake Keechelus <sup>10</sup>	Earth and gravel fill	70	6, 500	639, 000
Do.	Clear Creek <sup>10</sup>	Single concrete arch	34	404	4, 100
Wyoming: Riverton.	Pilot Butte	Earth embankment	40	2, 400	180, 000
Do.	Bull Lake	do.	75	3, 300	600, 000
Shoshone	Shoshone <sup>10</sup>	Rubble concrete arch	328	200	78, 576
Do.	Ralston <sup>10</sup>	Earth fill	50	2, 200	24, 740
Do.	Deaver	do.	14	1, 300	30, 300
Total.					23, 196, 356

<sup>1</sup> Tentative.<sup>10</sup> Completed.<sup>11</sup> Not designed.<sup>12</sup> First construction may be for a dam of less height with provision for raising to height stated.<sup>13</sup> Completed except permanent spillway.<sup>14</sup> Completed to height of 72.5 feet; crest length, 525 feet; volume, 196,400 cubic yards.<sup>15</sup> Completed to height of 19 feet.<sup>16</sup> Including spillway and approaches, 1,675 feet.<sup>17</sup> Including spillway, 619,000 cubic yards.<sup>18</sup> Present development, rock-fill timber crib; height, 11 ft.; volume, 1,500 cubic yards.

## Engineering data for projects when completed—Continued

## DIVERSION DAMS

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Arizona: Salt River	Granite Reef <sup>10</sup>	Rubble concrete weir	38	1,000	40,000
Do	Power Canal <sup>10</sup>	do	12½	400	4,800
Do	Joint Head <sup>10</sup>	Concrete weir	10	600	1,740
Arizona-California:	Laguna <sup>10</sup>	Indian weir, concrete and rock fill <sup>10</sup>	10	4,780	441,732
Yuma.					
California: Orland	South Canal <sup>10</sup>	Concrete on piling, with rock fill.	20	900	2,886
Do	North side <sup>10</sup>	Concrete weir, with removable timber crest.	8	380	270
Do	East Park Feed Canal <sup>10</sup>	Concrete arch	44	154	1,777
Colorado:					
Grand Valley	Colorado River Diversion <sup>10</sup>	Masonry ogee weir with roller crest 10 to 15 feet high.	24	546	25,682
Uncompahgre	Gunnison <sup>10</sup>	Crib with rock fill and movable flashboards.	15½	237	3,200
Do	Montrose and Delta <sup>10</sup>	Timber weir with concrete apron sluiceway and cut-off wall.	6.8	68½	172
Do	Loutsanhizer <sup>10</sup>	Pile and timber weir	8	100	206
Do	Selig <sup>10</sup>	Pile and timber weir with concrete sump.	6	96½	
Do	Ironstone <sup>10</sup>	Pile foundation with timber deck and needle flashboards.	8½	58½	
Do	East <sup>10</sup>	Pile and timber weirs, movable flashboards.	( <sup>20</sup> )	144	
Do	Garnet <sup>10</sup>	Rock baskets, faced and surfaced with concrete.	6½	75	500
Idaho:					
Boise	Boise River <sup>10</sup>	Rubble concrete weir	45	246	21,780
Do	Black Canyon <sup>10</sup>	Concrete masonry	183	4,040	79,844
Minidoka	Minidoka <sup>10</sup>	Combined diversion and storage dam. (See Storage.)			
Montana:					
Milk River	Swift Current <sup>10</sup>	Earth and timber crib	13	2,800	86,700
Do	St. Mary <sup>10</sup>	Concrete	6.5	198	480
Do	Chinook <sup>21</sup>	Timber crib rock filled, concrete abutments, movable crest.	25	319	12,000
Do	Dodson <sup>10</sup>	Reinforced concrete, automatic movable crest.	34	1,500	11,000
Do	Vandalia <sup>10</sup>	Concrete masonry	132	212	6,200
Sun River	Sun River <sup>10</sup>	Rock-filled, timber weir	12	700	14,500
Montana-North Dakota: Lower Yellowstone.	Lower Yellowstone <sup>10</sup>				
Nebraska-Wyoming: North Platte.	Whalen <sup>10</sup>	Concrete weir	29	300	80,740
Do	Horse Creek <sup>10</sup>	do	12	100	220
Nevada: Newlands	Truckee River <sup>10</sup>	16 concrete sluiceways	22	171	3,322
Do	Carson River <sup>10</sup>	23 concrete sluiceways	20	240	2,707
New Mexico: Carlsbad.	Avalon <sup>10</sup>	Combined storage and diversion. (See Storage.)			
New Mexico-Texas: Rio Grande.	Leasburg <sup>10</sup>	Rubble concrete weir	10.8	600	2,413
Do	Mesilla <sup>10</sup>	do	16.7	303	2,876
Do	Mexican <sup>21</sup>	Rubble masonry	4.7	320	1,200
Do	Percha <sup>10</sup>	Rubble concrete	17	350	4,346
Oregon: Umatilla	Feed Canal (Echo) <sup>10</sup>	Concrete weir on timber crib	2½	400	296
Do	Maxwell Canal <sup>10</sup>	do	2.3	176	43
Do	Three-Mile Falls <sup>10</sup>	Concrete multiple arch	24	800	4,160
Oregon-California: Klamath.	Lost River <sup>10</sup>	Hollow reinforced concrete	40	260	5,550
Do	Lower Lost River <sup>24</sup>	Reinforced concrete	15	204	625
Do	Malone <sup>10</sup>	Earth, with concrete spillway.	30	515	18,800
Do	Miller	do	12	280	1,000

<sup>10</sup> Completed.<sup>11</sup> Maximum height 40 feet from bottom of sheet piling to top of dam; water raised 10 feet.<sup>20</sup> Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.<sup>21</sup> Length, including logway.<sup>22</sup> Will be constructed by irrigation districts. No data available as to type and dimensions.<sup>23</sup> Constructed by Mexican authorities and used jointly.<sup>24</sup> Under construction.<sup>25</sup> Includes 320 acres of vested rights and 171 acres of town and school sites.

*Engineering data for projects when completed—Continued*

## DIVERSION DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
South Dakota: Belle Fourche.	Diversion <sup>10</sup> .....	Concrete weir.....	Feet 23	Feet 400	Cubic yds. 12, 149
Utah: Strawberry Valley.	Spanish Fork <sup>10</sup> .....	do.....	16	70	1, 262
Do.....	Indian Creek Cross- ing. <sup>10</sup> .....	Earth.....	17	1, 300	15, 183
Washington: Okanogan.....	Salmon Creek <sup>10</sup> .....	Concrete weir.....	41½	50	132
Yakima.....	Sunnyside <sup>10</sup> .....	Concrete ogee weir.....	8½	500	2, 291
Do.....	Tieton Diversion <sup>10</sup> .....	Concrete and rock-filled crib.	3	110	334
Wyoming: Riverton.....	Wind River <sup>10</sup> .....	Concrete weir with earth embankment.	37	2, 285	123, 880
Shoshone.....	Corbett <sup>10</sup> .....	Reinforced concrete weir.....	18	400	4, 951
Do.....	Willwood <sup>10</sup> .....	Concrete gravity, with ogee weir section.	69.5	320	22, 119
Total.....					1, 065, 707

<sup>10</sup> Completed.

## IRRIGABLE AREA, PRESENT STATUS

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	With- drawn			Rail- road, unsold	Other	
Arizona:	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Salt River.....	16, 170						197, 000	213, 170
Gravity system.....							183, 247	183, 247
Pumping system.....	16, 170						13, 753	29, 923
Arizona-California: Yuma.....	16, 714	1, 632	33, 284		8, 200		50, 170	110, 000
Arizona—								
Valley.....	6, 070		1, 000				42, 930	50, 000
Mesa.....	4, 444	1, 632	31, 884				7, 040	45, 000
California—Reservation.....	6, 200		400		8, 200		200	15, 000
California:								
Orland—Main.....							20, 665	20, 665
Colorado:								
Grand Valley.....	13, 442	403	12, 310				28, 845	55, 000
Garfield gravity.....	10, 912	403	8, 280				15, 405	35, 000
Garfield pumping.....	2, 530		4, 030				3, 440	10, 000
Orchard Mesa pump- ing.....							10, 000	10, 000
Uncompahgre.....	19, 258	1, 309	674				75, 823	97, 064
South.....	2, 352	251	37				6, 339	8, 979
West.....	2, 245	10	12				4, 033	6, 300
Montrose and Delta.....	5, 280	70	31				23, 257	28, 638
Loutsenhizer.....	226						6, 463	6, 689
Selig.....	4, 154	511	480				7, 433	12, 578
Ironstone.....	1, 181	65	20				16, 752	18, 018
East.....	3, 812	402	94				8, 870	13, 178
Garnet.....	8						2, 676	2, 684
Idaho:								
Boise.....	67, 874		5, 560	5, 980			274, 987	354, 401
Arrowrock (Idaho).....	66, 635			60			203, 796	270, 491
Arrowrock (Oregon).....	1, 239						5, 697	6, 936
Notus.....							6, 874	6, 874
Hillcrest.....			2, 230				11, 870	14, 100
Black canyon.....			3, 330	5, 920			46, 750	56, 000
King Hill.....		8		426			16, 454	16, 888
Minidoka.....	96, 149	570	106, 840	8, 999			24, 016	236, 574
Pumping.....	30, 258			788			17, 914	48, 960
Gravity.....	65, 891	570		371			5, 782	72, 614
North side pumping extension.....			106, 840	7, 840			320	115, 000

<sup>10</sup> Includes 320 acres of vested rights and 171 acres of town and school sites.

## Engineering data for projects when completed—Continued

## IRRIGABLE AREA, PRESENT STATUS—Continued

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	Withdrawn			Rail-road, unsold	Other	
Montana:	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Huntley	26,053	131	2,560		394		3,324	32,462
Gravity	21,219	131	1,854		394		3,324	26,922
Pumping	4,834		706					5,540
Divisions—								
Pryor	23,436	131	1,812		215		2,732	28,326
Eastern	923		42		179		592	1,736
Fly Creek	1,694		706					2,400
Milk River	29,732		16,151	5,567			95,030	146,480
Chinook division	1,941		2,148	1,223			51,479	56,791
Malta division	21,833		13,583	3,181			29,113	67,710
Glasgow division	5,958		420	1,163			14,438	21,979
Sun River	39,919	429	38,026	6,881			28,596	113,851
Sun River Slope	700		12,900	1,100			2,300	17,000
Big Coulee				356			1,962	2,318
Greenfields	24,734		21,915	4,771			20,701	72,121
Mill Coulee	3,000		3,000	500			2,000	8,500
Fort Shaw	11,486	429	211	154			1,633	13,912
Montana—North Dakota:								
Lower Yellowstone	13,735		2,067	986		95	42,466	59,349
Montana	7,088		1,000	846		95	29,939	39,028
North Dakota	6,647		1,007	140			12,527	20,321
Divisions—								
Gravity	13,475		2,011	704		50	40,801	57,041
Pumping	260		56	282		45	1,665	2,306
Nebraska—Wyoming:								
North Platte	136,063		17,264	1,771			33,485	238,563
Interstate division	83,697		1,443	529			29,264	114,933
Nebraska	81,086		1,143	529			28,985	111,743
Wyoming	2,611		300				279	3,190
Fort Laramie division	44,847		15,511	1,242			45,700	107,300
Nebraska	8,708		7,200				38,325	54,233
Wyoming	36,139		8,311	1,242			7,375	53,067
Northport division, Nebraska	7,519		310				8,521	16,350
Nevada: Newlands	31,741	4,061	26,321		23,877	20,000	53,000	169,000
Carson division	27,721	4,061	4,701		4,877	2,500	39,140	83,000
Truckee division	4,020		2,120			2,000	13,860	22,000
Pyramid division			4,600		19,000	1,600		25,000
Loveclock division			15,000			14,000		29,000
New Mexico: Carlsbad	45						24,946	24,991
New Mexico—Texas:								
Rio Grande	1,500	100	700	1,000			146,700	150,000
New Mexico	1,500	100	700	1,000			82,700	86,000
Texas							64,000	64,000
Divisions—								
Rincon		20		700			15,900	17,000
Leasburg	600	40	640	200			29,950	31,000
Mesilla	900	40	60	100			45,850	47,000
El Paso							55,000	55,000
North Dakota: Williston	254	139		23			10,337	10,753
Oregon:								
Umatilla	5,413		2,376			3,319	17,192	28,300
East division	3,030					1,407	12,563	17,000
West division	2,383		2,376			1,912	4,629	11,300
Oregon—California: Klamath	5,779		20,934				141,184	167,897
Oregon	2,917		1,327				103,696	107,890
California	2,862		19,607				37,548	60,017
Divisions—								
Main	2,752						39,668	42,420
Tule Lake	3,027		20,934				239	24,200
Pumping							20,595	20,595
Langell Valley							20,782	20,782
Bonanza Springs							5,900	5,900
Lower Klamath Lake							64,000	64,000
South Dakota: Belle Fourche	37,732		12,008	667			45,886	96,293
Utah: Strawberry Valley	1,953						51,936	53,889
High Line	1,953						19,417	21,370
Spanish Fork							22,519	22,519
Springville-Mapleton							10,000	10,000

\* Three thousand acres to be allotted to about 600 Indians; remainder of land to be sold in accordance with act (33 Stat. 225).

\* Includes some public land, but distribution not known.

\* The 1,500 acres of irrigable area formerly included in the proposed Santaquin pumping district under the High Line division, have been eliminated from this report.

*Engineering data for projects when completed—Continued*

## IRRIGABLE AREA, PRESENT STATUS—Continued

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	Withdrawn			Railroad, unsold	Other	
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Washington:	116					7,473		7,589
Okanogan								6,414
Gravity Pumping								1,175
Yakima	7,358		13,688	5,939	241	21,729	291,032	339,987
Sunnyside	2,627			30	241		104,702	107,600
Tieton	2,048			4			29,948	32,000
Roza	120		1,523	2,067		11,310	43,330	58,350
Moxee	1,663		775	1,332		2,783	30,197	36,750
Kittitas *			4,990	1,406		3,936	59,955	70,287
Kennewick	900		6,400	1,100		3,700	22,900	35,000
Wyoming:								
Riverton			69,000		1,000		30,000	100,000
Shoshone	62,517	2,283	125,692	18,451		687	8,760	218,400
Montana, Frannie division	87			4				91
Wyoming—								
Garland division	40,065	891	711	352			1,981	44,000
Frannie division	22,365	1,402	2,969	995		687	1,491	29,909
Willwood division			14,312	500			788	15,600
Heart Mountain division			33,100	3,200			2,500	38,800
Oregon Basin division			74,600	13,400			2,000	90,000
Total primary projects	629,517	11,075	505,455	56,690	33,712	45,830	1,769,307	3,051,586

\* Distribution estimated.



# SUMMARY OF CONSTRUCTION RESULTS, JUNE 30, 1924

Items	To June 30, 1924		To June 30, 1923		Increase	
Reservoir capacity available (original).....	Acre-feet 10, 018, 993		Acre-feet 9, 758, 000		Acre-feet 260, 993	
CANALS, DITCHES, AND DRAINS						
	Miles		Miles		Miles	
Canals over 800 second-feet capacity.....	511		511		-----	
Canals 301 to 800 second-feet capacity.....	713		686		27	
Canals 50 to 300 second-feet capacity.....	2, 271		2, 185		86	
Canals less than 50 second-feet capacity.....	9, 087		8, 729		358	
Total canals.....	12, 582		12, 111		471	
Waste-water ditches.....	982		931		51	
Drains, open.....	1, 499		1, 236		263	
Drains, closed.....	212		196		16	
Total.....	2, 693		2, 363		330	
Grand total.....	15, 275		14, 474		801	
TUNNELS						
Number.....	105		103		2	
Length (feet).....	146, 614		145, 810		804	
STORAGE AND DIVERSION DAMS						
	Cubic yards		Cubic yards		Cubic yards	
Masonry.....	2, 238, 901		2, 151, 361		87, 540	
Earth.....	12, 798, 419		11, 935, 701		862, 718	
Rockfill and crib.....	1, 679, 865		1, 416, 133		263, 732	
Total.....	16, 717, 185		15, 503, 195		1, 213, 990	
DIKES AND LEVEES						
Length and volume.....	Feet 1, 010, 372	Cubic yards 5, 204, 264	Feet 757, 305	Cubic yards 5, 002, 681	Feet 253, 067	Cubic yards 201, 583
	Concrete	Wood	Concrete	Wood	Concrete	Wood
CANAL STRUCTURES						
	Number	Number	Number	Number	Number	Number
Costing over \$2,000.....	1, 385	229	1, 306	218	79	11
Costing from \$500 to \$2,000.....	3, 030	909	2, 874	869	156	40
Costing \$100 to \$500.....	16, 275	10, 010	14, 120	8, 968	2, 155	1, 042
Costing less than \$100.....	29, 096	74, 127	25, 524	71, 627	3, 572	2, 500
Total.....	49, 786	85, 275	43, 824	81, 682	5, 962	3, 593
Grand total.....	135, 061		125, 506		9, 555	
	Number	Length	Number	Length	Number	Length
BRIDGES						
		Feet		Feet		Feet
Steel.....	112	9, 124	108	8, 664	4	460
Combination.....	422	12, 776	414	12, 542	8	234
Wood.....	9, 296	216, 083	8, 217	190, 438	1, 081	25, 645
Concrete.....	361	4, 934	354	4, 838	7	96
Total.....	10, 193	242, 917	9, 093	216, 482	1, 100	26, 435
CULVERTS						
Concrete.....	3, 198	154, 512	2, 758	135, 267	440	19, 245
Metal.....	2, 280	80, 476	2, 165	75, 461	115	5, 015
Terra cotta.....	2, 006	80, 127	1, 901	76, 777	105	3, 350
Wood.....	4, 228	108, 603	4, 189	101, 801	39	6, 802
Total.....	11, 712	423, 718	11, 013	389, 306	699	34, 412
PIPE						
	Linear feet		Linear feet		Linear feet	
Concrete.....	915, 295		906, 851		108, 444	
Metal.....	319, 608		275, 027		44, 581	
Terra cotta (tile).....	1, 612, 296		1, 472, 784		139, 512	
Wood.....	660, 596		602, 136		58, 460	
Total.....	3, 507, 795		3, 156, 798		350, 997	

## Summary of construction results, June 30, 1924—Continued

FLUMES	Number	Length	Number	Length	Number	Length
		<i>Feet</i>		<i>Feet</i>		<i>Feet</i>
Concrete.....	100	71,940	99	66,294	1	5,646
Metal.....	1,509	212,717	1,260	198,901	249	15,726
Wood.....	2,546	494,773	2,455	482,890	91	11,883
Total.....	4,155	779,430	3,814	746,175	341	33,255

	Concrete	Wood	Concrete	Wood	Concrete	Wood
CANALS LINED						
Length (miles).....	412.02	4.12	394.20	4.12	17.82	.....
Total.....	416.14		398.32		17.82	

	<i>Number</i>	<i>Number</i>	<i>Number</i>
BUILDINGS			
Offices.....	101	99	2
Residences.....	730	715	15
Power plants.....	33	31	2
Pumping stations.....	178	167	11
Barns, storehouses, etc.....	575	561	14
Total.....	1,617	1,573	44

	Number	Depth	Number	Depth	Number	Depth
WELLS						
Number and depth.....	629	61,475	586	58,393	43	3,082

	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
COMMUNICATIONS			
Roads.....	1,044	1,038	6
Railroads.....	83	83	.....
Telephone lines.....	3,349	3,284	65
Transmission lines.....	1,395	1,157	238
Total.....	5,871	5,562	309

POWER DEVELOPED			
Water and steam, horsepower.....	64,159	64,159	.....

	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
EXCAVATION			
Class 1, earth.....	212,634,034	195,530,837	17,103,197
Class 2, indurated material.....	12,340,294	11,822,513	517,781
Class 3, rock.....	9,965,851	9,520,940	444,911
Total.....	234,940,179	216,874,290	18,065,899

Riprap (cubic yards).....	2,378,387	2,316,171	62,166
Paving (square yards).....	962,682	939,411	23,271
Concrete (cubic yards).....	3,450,251	3,273,745	176,506
Cement (barrels).....	3,408,191	3,307,152	101,039

## POWER AND PUMPING

Power plants operated on Bureau of Reclamation projects during the fiscal year 1923-24

Project	Name of plant	Type of plant	Station capacity	Number of units	Head	First cost of plant	Cost of operation	Estimated depreciation	Cost per kilowatt exclusive of depreciation	Distribution of power generated (kilowatt hours)					Gross power sales
										Output	Sold to consumers	Used for irrigation purposes	Used for other purposes	Losses	
										Kilowatt-hours	Kilowatt-hours	Kilowatt-hours	Kilowatt-hours	Kilowatt-hours	
Boise Mindoka Do <sup>1</sup>	Boise River <sup>1</sup>	Hydroelectric	Ke-a	3	30	\$187,905.37	\$12,183.61	\$5,540.00	\$0.002874	5,836,028	5,725,038	110,988			\$11,000.00
	Mindoka	do.	7,000	5	48.21	455,317.40	22,771.25	15,012.00	.0004704	48,400,426	20,464,920	24,260,960			109,808.00
	American Falls (2 plants)	do.	1,540	3	36 and 45	75,000.00	3,535.96	14,450.00							
	Labontan	do.	1,875	3	110	141,896.01	6,272.00	5,000.00	.00108	5,794,200	5,700,275	33,400	58,525		18,783.18
Newlands Williston North Platte Okanogan	Williston	Steam-electric	1,150	4	105	175,000.00	61,291.23	3,000.00	.00325	1,896,487	1,055,430	316,586			58,536.53
	Lingle	Hydroelectric	750	2	105	88,988.50	22,742.08	16,800.00	.00794	2,892,845	1,162,580				34,028.85
	Power Plant No. 1 <sup>2</sup>	do.	187	1	108	11,923.44									
	Power Plant No. 2 <sup>3</sup>	do.	187	1	55	13,981.42									
Rio Grande Salt River	Elephant Butte No. 2	do.	187	1	147.55	8,440.50	2,140.00	283.00	.0038	28,700	625	28,075			50.00
	Arizona Falls	do.	1,080	2	19	109,500.73	8,923.55	5,475.04	.004125	3,029,800					
	Chauder	do.	400	1	40	91,990.84	17,174.30	4,599.54	.003257	3,847,450					
	Croscut	do.	5,260	6	111	755,147.29	31,385.71	37,757.36	.00188	13,333,200	446,631,376	11,671,154	5,414,296	9,815,844	546,882.90
Shoshone Strawberry Valley Yakima Storage	Shoshone	do.	1,750	6	80-225	870,317.04	87,987.25	53,515.90	.00157	44,502,300					
	South Consolidated	do.	1,600	2	23	163,138.60	10,070.91	8,186.98	.00421	6,086,100					
	Shoshone	do.	2,000	2	120-220	585,454.00	9,468.68	14,748.00	.0038	1,645,686	215,923		1,098,167	361,597	8,114.63
	Spanish Fork	do.	1,000	2	123.5	60,794.80	16,486.32	3,083.72	.0115	1,437,000	1,206,494		157,121	74,385	24,460.65
Yakima Sunnyside Riverton	Tieton No. 1 <sup>4</sup>	do.	270	2	45	40,000.00		11,510.88							
	Tieton No. 2	do.	1,000	2	74	76,768.16	9,644.50	34,436.50	.00250	3,450,000			3,724,000	128,000	
	Rocky Ford	do.	187	1	73	23,000.00	2,065.00	1,068.00	.00286	720,300			720,300		
	Pilot Butte	do.	1,000	1	90-106	( <sup>5</sup> )									

<sup>1</sup> Under a contract between the United States and the Idaho Power Co., dated Apr. 1, 1923, the output of this plant is delivered to the company on an exchange basis.<sup>2</sup> Plant acquired but not operated during fiscal year 1923-24.<sup>3</sup> Not operated during fiscal year 1923-24. Operation and maintenance shown is for repair to plant.<sup>4</sup> All five plants supply the same distributing system.<sup>5</sup> Book value at present \$1,889.65.<sup>6</sup> This amount includes cost of transmission lines and transformers to value of \$9,000. Estimated \$124,200. Not completed.

Pumping plants operated on Bureau of Reclamation projects during fiscal year 1923-24

Project	Name of plant	Type of pump- ing unit	Plant capac- ity	Num- ber of units	Net lift	First cost of plant and lift	Cost of operation	Estimated deprecia- tion	Energy used for pumping	Acre-foot pumped	Cost per acre-foot without deprecia- tion.	
											Per acre-foot	Per foot lift
Grand Valley Huntley	Price Strub	V. T. D. C.	125	1	Feet 31	\$46,097.83	\$590.00	\$1,000.00	Kilowatt-hour 6,170	6,170	\$0.004	\$0.00803
	Ballantine	V. T. D. C.	620	2	45	73,833.32	1,153.32	2,000.00	9,022	9,022	1.29	.00287
	O. E. D. C.	O. E. D. C.	400	2	45	71,103.56	1,755.96	3,500.00	1,334	1,334	1.31	.029
	A-4 Relief	Scoop wheel	25	5	3.5	3,326.42	8,655.29	249.68	36,515	36,515		
	Pumping station No. 1	V. M. D. C.	2,760	1	29.2	186,620.06		19,380.00	9,749,043	218,968		
Minidoka	Pumping station No. 2	V. M. D. C.	2,400	4	30.2	184,920.00			5 14, 512, 937	183,971		
	Pumping station No. 3	V. M. D. C.	1,560	3	20.0	103,106.96			111,963	111,963		
	Boersch Lake	V. M. D. C.	1,200	2	19.8	32,947.72		1,647.39	619,950			
	C-2 pumping station	Scoop wheel		1	2.5				16,279			
	114 pumping station	H. M. D. C.	7.5	1	7	2,803.97		182.26	8,536			
Williston	1812 pumping station	H. M. D. C.	5.0	1	4	1,063.76		65.57	8,166			
	1817 pumping station	H. M. D. C.	10.0	1	4.8	3,634.71		272.82	9,270			
	West End pumping station	H. M. D. C.	150	2	21.25	18,745.61		817.30	448,245			
	Pumping station No. 1	S. T. D. C.	450	2	56	8,850.00		300.00	42,210			
	Pumping station No. 2	H. M. D. C.	175	2	26.6	13,065.00	2,605.52	800.00	70,749	492	5.30	.0947
North Platte	Pumping station No. 3	H. M. D. C.	405	3	32	39,647.00	4,990.87	1,000.00	121,171	570	8.70	.827
	Pumping station No. 4	H. M. D. C.	100	3	27.25	8,831.00	10,454.62	500.00	35,209	1,262	8.35	.261
	Dutch Flat Drain No. 1	V. M. D. C.	30	1	52	11,246.27	2,505.88		90,350	193	8.62	.313
	Dutch Flat Drain No. 2	V. M. D. C.	30	1	30	11,246.27						
	Dutch Flat Drain No. 3	V. M. D. C.	40	1	47	11,246.27		1,700.00			3.19	.08
Okanogan	Duck Lake (old)	H. M. D. C.		1	55	17,201.92			121,786	1,471.6	1.50	.0273
	Government Well, No. 1 and No. 2	V. M. D. C.	30	2	45-51	18,588.21	2,218.63		57,463	338.2	7.40	.1542
	Robinson Flat	H. M. D. C.	400	2	188	30,077.24	12,110.64		651,000	1,775.1	6.82	.0364
	Salmon Lake	G. E. D. C.	275	2	18-23	17,842.16	7,270.04		1,068	1,068	6.68	.3339

\* Operated by Minidoka Irrigation district.  
 \* Total for all stations operated by Minidoka Irrigation district.  
 \* Includes cost of power not formerly included.

\* Total for three South Side stations.  
 \* Total for stations 2 and 3.

\* Average for all three stations.  
 \* Barge replaced by permanent land station.

\* Second-foot capacity has been purchased. Capacity of motors when third unit is installed, 345 horsepower.  
 \* Power supplied by Washington Water Power Co.

Cost to date \$27,984. Estimated cost when complete \$30,000. Two pumping units transferred from barge and one new unit of

## Pumping plants operated on Bureau of Reclamation projects during fiscal year 1923-24—Continued

Project	Name of plant	Type of pump- ing plant	Plant capac- ity	Num- ber of units	Net lift	First cost of plant	Cost of operation	Estimated deprecia- tion	Energy used for pumping	Acre-foot pumped	Cost per acre-foot without deprecia- tion	
											Per acre-foot	Per foot lift
Salt River	Chandler division <sup>a</sup>	{ 10 V. M. D. C. 1 H. M. D. C.	Horse- power	12	35.10	\$148,084.21	\$13,241.82	\$10,365.89	Kilowatt-hour	2,345,206	\$0.424	-----
	Highline Pumping Plant <sup>a</sup>	H. M. D. C.	920	4	47	91,038.90	13,483.87	4,551.94	3,331,283	34,978	.3855	-----
	Tempe Pumping Plant <sup>a</sup>	H. M. D. C.	900	1	45	5,728.84	5,637.68	401.09	877,760	8,907	.633	-----
	Mesa division <sup>a</sup>	V. M. D. C.	726	17	22.06	145,047.84	5,762.31	10,133.95	1,235,720	20,941	.2754	-----
	Laveen division <sup>a</sup>	H. M. D. C.	225	3	-----	115,808.85	427.11	1,112.30	135,845	2,150	.20	-----
	Phoenix division <sup>a</sup>	V. M. D. C.	455	23	55.65	133,791.11	10,758.05	9,365.38	2,035,806	14,205	.767	-----
	Tempe division <sup>a</sup>	H. M. D. C.	75	1	30.7	12,186.00	25.28	8,530.20	21,738	120	.21	-----
	Salt River division <sup>a</sup>	V. M. D. C.	705	21	30.7	175,240.44	13,684.86	12,266.83	2,472,273	34,609	.305	-----
	San Francisco <sup>a</sup>	H. M. D. C.	50	1	38	29,973.90	40,410.53	2,967.90	98,156	442	.442	-----
	Tolleson division <sup>a</sup>	V. M. D. C.	650	20	37	168,360.75	11,358.39	11,785.25	2,515,604	29,865	.3668	-----
Yakima Sunny- side.	Grand View	{ 1-V. T. D. C. 2-H. M. D. C.	365	3	35-78	72,000.00	3,200.00	3,120.00	-----	13,003	.235	\$0.00412
	Hillcrest	V. T. D. C.	35	1	103	5,800.00	128.50	300.00	-----	453	.279	.0027
	Little Snipes Mountain	H. T. D. C.	5	1	80	1,163.00	45.31	45.00	-----	80	.543	.011
	Outlook	V. T. D. C.	800	2	110	97,000.00	3,413.76	2,480.00	-----	16,256	.210	.0019
	Prosser	H. T. D. C.	193	1	106	31,963.00	1,436.00	1,500.00	-----	3,544	.403	.0083
	Snipes Mountain	V. T. D. C.	850	2	200	43,800.00	2,788.79	1,800.00	-----	7,138	.800	.0019
	Spring Creek	H. T. D. C.	160	1	90	28,000.00	1,330.84	1,500.16	-----	3,653	.364	.004
	"B" Lift	{ 1-V. M. D. C. 2-H. M. D. C.	1,100	3	69	159,524.11	32,856.64	600.00	924,000	5,892.5	5.66	.061
	Reservation <sup>a</sup>	G. E. D. C.	110	2	0-6	6,775.60	4,634.62	500.00	-----	760	6.10	2.65
	Valley Drainage	{ 2-G. E. D. C. 1-H. M. D. C.	275	3	11.53	191,064.91	21,907.21	2,500.00	484,220	50,608	.433	.0382
Lower Yellow- stone.	West Yuma pumping	G. E. D. C.	35	1	7	900.00	731.73	75.00	-----	95	7.70	1.10
	Thomas Point	H. T. D. C.	220	2	31	49,857.72	151.19	1,000.00	( <sup>11</sup> )	1,980	.076	.00206
Klamath	Dry Lake pumping plant <sup>a</sup>	V. T. D. C.	75	1	51	32,000.00	-----	-----	-----	-----	-----	-----

Type V. M. D. C. = vertical motor-driven centrifugal pump. H. M. D. C. = horizontal motor-driven centrifugal pump. S. T. D. C. = steam turbine-driven centrifugal pump.  
V. T. D. C. = vertical hydraulic turbine-driven centrifugal pump. H. T. D. C. = horizontal hydraulic turbine-driven centrifugal pump. O. E. D. C. = oil-engine driven centrifugal pump. O. E. D. S. = oil-engine-driven screw pump. G. E. D. C. = gasoline-engine-driven centrifugal pump.

<sup>a</sup> Cost of power is actual operation and maintenance power cost without depreciation charge and varies from \$0.00158 to \$0.0086.

<sup>11</sup> In operation about three months only.

<sup>12</sup> Partially completed. Under construction.

<sup>13</sup> Operation and maintenance costs include major repairs to plant.

<sup>14</sup> Not in regular operation fiscal year 1923-24.

<sup>15</sup> Water power.

Principal contracts for sale of power in force June 30, 1924

Project	Name of contractor	Date of contract	Date of expiration	Maximum load	Rate per kilowatt-hour	Gross income, fiscal year 1923-24	Remarks
Boise	Idaho Power Co.	Apr. 1, 1923	Mar. 31, 1926	Kilowatt		\$11,000.00	Load limited by water supply.
Minidoka	Amalgamated Sugar Co.	May 1, 1922	Feb. 28, 1926	7-67	Minidoka Standard.	1,634.75	
	City of Burley	Jan. 15, 1920	Jan. 1, 1930	563-2,780	do.	47,182.22	
	City of Rupert	do	do	227-1,988	do.	23,953.86	
	East End Electric Co.	Jan. 23, 1918	Jan. 23, 1928	15	do.	1,039.68	
	Ferry Light & Power Co.	Mar. 12, 1918	Mar. 12, 1929	15	do.	953.89	
	Minidoka Irrigation District	Dec. 2, 1916	do	Req. of Irrig.	\$0.003	3,396.16	
	Paul Electric Co.	Feb. 4, 1924	Mar. 31, 1934	80-150	Minidoka Standard.	6,070.59	
	Rural Electric Co.	Mar. 19, 1917	Mar. 31, 1927	11-15	do.	1,394.14	
	Unity Light & Power Co.	do	Mar. 19, 1927	30-41	do.	2,632.88	Minimum monthly payment \$40.
	Village of Albion	Oct. 15, 1915	Jan. 8, 1926	30-100	do.	5,502.29	Power.
	do	Sept. 18, 1916	do	200	\$1.25 per kilowatt-month.	2,120.35	Heat.
	Village of Declo	Oct. 26, 1920	Nov. 1, 1930	30-41	Minidoka Standard.	2,029.36	
	Village of Heyburn	Mar. 9, 1920	Jan. 1, 1930	272-1,032	do.	1,466.59	
	Village of Minidoka	Feb. 5, 1924	Apr. 1, 1934	50	do.	538.45	Started to use energy May 21.
	59 small contracts			154.5	do.	7,480.01	Each less than \$1,000 annual revenue.
Newlands	Canyon Power Co.	July 10, 1914	Nov. 30, 1924	1,600	{           \$0.0025 kilowatt-hour on gross output Apr. 1-Sept. 30. \$0.0035 kilowatt-hour on gross output Oct. 1-Mar. 30.           }	18,581.83	Minimum monthly payments Apr. 1-Sept. 30 each year, \$1,200.
Williston	City of Williston	Sept. 25, 1922	Sept. 25, 1932	600	{           First 60,000 kilowatt-hours, 5 cents. Next 40,000 kilowatt-hours, 3 cents. Over 100,000 kilowatt-hours, 2 cents.           }	44,982.85	
North Platte	City of Mitchell, Nebr.	May 5, 1922	Apr. 30, 1924	135	North Platte Standard	10,386.43	
	City of Torrington, Wyo.	May 10, 1923	May 10, 1925	125	do.	10,342.54	
	Platte Valley Power Co.	May 1, 1922	May 1, 1929	25	do.	1,428.04	
	R. S. Morrow & Son	May 12, 1923	Dec. 31, 1924		3 cents for first 10,000 kilowatt-hours; 2½ cents per kilowatt-hour for remaining.	3,771.75	

## Principal contracts for sale of power in force June 30, 1924—Continued

Project	Name of contractor	Date of contract	Date of expiration	Maximum loan	Rate per kilowatt-hour	Gross income fiscal year 1923-24	Remarks
Shoshone	Security Land Co.	Feb. 9, 1922	Feb. 9, 1927	<i>Kilowatt</i> 25	North Platte Standard	\$1,337.28	
	Town of Lingie	Jan. 19, 1922	Oct. 26, 1924	25	do	2,296.63	
	Village of Morrill	May 2, 1922	Apr. 30, 1924	55	do	4,424.18	
	Town of Powell	Sept. 26, 1923	Sept. 30, 1926	75	Shoshone Standard	6,447.82	
	Cowley Gas Co.	May 18, 1923	June 2, 1933	15	do	808.82	
	C., B. & Q. R. Co.	June 1, 1923	Jan. 11, 1934	20	do	338.13	
	Nellie DeMaris	Jan. 24, 1923	Mar. 24, 1933	5	do	118.72	
	G. W. Gorrell	Apr. 1, 1924	Apr. 10, 1927	1	30 kilowatt-hours, 10 cents; balance, 4 cents+10 per cent.	8.80	
	G. V. Davis	May 20, 1924	June 27, 1927	1	30 kilowatt-hours, 10 cents; balance, 4 cents.	4.00	
	Spanish Fork City	Feb. 3, 1922	Feb. 5, 1925	200	Rated on maximum demand	9,868.60	
Strawberry Valley	Payson City	do	do	120	do	10,613.41	
	Salem City	do	do	40	do	1,594.18	
	Springville City	June 15, 1923	July 25, 1926	125	2 cents for first 10,000 kilowatt-hours per month; 1½ cent for from 10,000 to 25,000 kilowatt-hours; 1 cent over 25,000 kilowatt-hours.	1,971.89	
	Castilla Hot Springs Co.	Sept. 6, 1919	Sept. 6, 1924	10	Strawberry Valley Standard	201.11	Minimum monthly charge, \$15
	Mapleton Light & Power Co.	Apr. 25, 1924	May 31, 1929	5	do	90.00	Minimum monthly charge, \$7.50
	Keeler Electric Co.	Apr. 9, 1921	Apr. 9, 1926	5	do	91.02	Do.
	Joseph Lucas	Feb. 15, 1922	Feb. 21, 1925	5	9 cents per kilowatt-hour	30.44	Minimum monthly charge, \$2. Contract canceled Apr. 30, 1924.

# DRAINAGE

Estimate of seepage and summary of drainage work to June 30, 1924

State and project	Constructed drains <sup>1</sup>		Estimated area damaged by seepage on June 30, 1924	Estimated area protected by constructed drains	Estimated area that will be protected when all drains authorized have been constructed
	Open	Closed			
	Miles	Miles	Acres	Acres	Acres
Arizona: Salt River <sup>1</sup>	15.85	5.3			
Arizona-California: Yuma—					
Reservation	11.70	4.00		8,000	8,000
Yuma Valley	37.30			31,500	50,000
Colorado: Grand Valley—					
Project lands	28.39	.48	500	4,480	5,780
Grand Valley drainage district	38.30	1.00	29,000	10,000	10,000
Teller Institute	2.80			300	300
Frey drain	1.60			300	300
Orchard Mesa	3.57		1,400	600	1,450
Uncompahgre <sup>1</sup>		96.00	16,200	9,400	9,400
Idaho: Boise—					
Riverside irrigation district	44.10		350	11,400	11,400
Pioneer irrigation district	78.50	.40	300	30,000	30,000
Nampa-Meridian irrigation district	45.76		400	51,000	51,000
Other parts	53.12	.10	4,000	8,000	12,000
King Hill <sup>1</sup>	.88		200	800	800
Minnesota—					
Gravity division	110.70		1,300	30,000	30,000
Pumping division			2,000		
Montana: Huntley	16.73	50.50	1,200	21,500	21,500
Milk River—					
Malta division	2.30		2,300	300	300
Glasgow division			200		
Sun River—					
Fort Shaw division			2,508		
Greenfields division	16.30		2,000	7,000	9,500
Montana-North Dakota: Lower Yellowstone	4.50	1.10	4,000	1,600	1,600
Nebraska-Wyoming: North Platte—					
Interstate division	35.17	14.60	2,800	6,000	8,200
Interstate division <sup>1</sup>	43.26				
Fort Laramie division	111.76		800	2,000	16,000
Northport division	5.81		160	1,500	1,500
Nevada: Newlands—					
Carson division	160.20	3.99	8,000	76,900	88,483
Truckee division	11.59		200	3,707	13,940
New Mexico: Carlsbad	11.14	3.65	5,500	5,031	5,031
New Mexico-Texas: Rio Grande—					
Rincon division	20.10		6,000	6,000	17,000
Leasburg division	67.10		800	30,000	31,000
Mesilla division <sup>1</sup>	119.30		900	45,000	47,000
El Paso division <sup>1</sup>	119.60		2,000	49,000	55,000
Oregon:					
Umatilla	11.50		500	2,450	3,000
Klamath	103.00	8.00	2,000	28,700	30,000
South Dakota: Belle Fourche			4,871		
Utah: Strawberry Valley <sup>1</sup>	18.90	71.50	8,500	11,422	19,922
Washington: Yakima—					
Sunnyside division <sup>1</sup>	82.85	95.07	10,000	50,357	50,357
Tieton division <sup>1</sup>	7.50	2.30	200	2,400	2,400
Wyoming: Shoshone—					
South Garland division	29.55	107.63	1,000	20,400	21,500
North Garland division	60.62	2.27	2,300	9,600	12,000
West Garland division	1.02	1.24		500	500
Frannie division	71.48		2,700	9,500	22,000
Total	1,608.85	469.13	127,089	586,647	696,163

<sup>1</sup> Surface drains and waste ditches not included.

<sup>2</sup> Drainage, including 99 drainage pumping stations constructed by water users' associations, has produced marked effect in lowering the water table in certain areas.

<sup>3</sup> Constructed by land owners, water users, or drainage districts.

<sup>4</sup> Outlet channels, of which 7.74 miles were built by the United States as a part of the project drainage, 17.35 miles by the United States under cooperative contracts, 16.17 miles by the Farmers' Irrigation District, and 2 miles by the Morrill Drainage District.

<sup>5</sup> Area benefited.

<sup>6</sup> Includes 1.7 miles of temporary outlet abandoned.

<sup>7</sup> Includes 0.4 mile of temporary outlet to be abandoned.

<sup>8</sup> All drainage work done by county drainage engineer through drainage improvement districts.



# SETTLEMENT DATA, 1923

State and project	Farms		Towns		Number of schools
	Number	Population	Number	Population	
Arizona: Salt River	5,500	36,000	12	51,000	63
Arizona-California: Yuma	1,207	3,800	5	5,730	16
California: Orland	703	1,945	1	1,700	10
Colorado:					
Grand Valley	396	1,185	6	11,246	24
Uncompahgre	1,694	6,097	3	7,450	26
Idaho:					
Boise	3,600	10,800	8	36,270	28
King Hill	184	598	4	1,525	6
Minidoka	2,453	7,371	6	7,070	22
Montana:					
Huntley	547	1,015	8	530	8
Milk River	211	506	15	7,675	35
Sun River	369	817	4	354	17
Montana-North Dakota: Lower Yellowstone	373	1,285	8	2,115	13
Nebraska-Wyoming: North Platte	2,019	6,179	18	18,900	94
Nevada: Newlands	788	2,737	5	2,500	11
New Mexico: Carlsbad	398	2,128	4	3,440	12
New Mexico-Texas: Rio Grande	3,743	15,925	12	111,983	78
North Dakota: Williston	63	224	2	4,500	6
Oregon: Umatilla	540	1,491	4	1,280	8
Oregon-California: Klamath	580	1,800	5	7,000	24
South Dakota: Belle Fourche	1,035	2,035	5	2,350	25
Utah: Strawberry Valley	2,741	6,500	12	16,000	23
Washington:					
Okanogan	458	1,430	3	2,600	7
Yakima-Sunnyside	3,181	10,128	11	7,250	41
Yakima-Tieton	1,305	3,453	8	23,000	10
Wyoming:					
Riverton			2	2,500	12
Shoshone	838	2,025	5	1,705	1
Total	34,936	127,654	206	337,873	609

State and project	Number of churches	Banks			
		Number	Capital stock	Deposits	Number of depositors
Arizona: Salt River	65	15	\$1,600,000	\$25,000,000	40,000
Arizona-California: Yuma	24	5	280,000	3,378,330	6,970
California: Orland	7	2	171,000	1,107,000	3,000
Colorado:					
Grand Valley	28	6	452,300	3,227,000	9,850
Uncompahgre	27	6	505,156	3,282,626	11,250
Idaho:					
Boise	58	14	1,750,000	15,295,000	30,000
King Hill	5	1	20,000	290,000	1,000
Minidoka	29	4	210,000	1,250,000	6,000
Montana:					
Huntley	9	2	50,000	155,000	800
Milk River	30	20	709,500	3,736,600	9,900
Sun River	11	3	65,000	212,000	650
Montana-North Dakota: Lower Yellowstone	15	4	100,000	308,645	1,850
Nebraska-Wyoming: North Platte	60	22	720,000	6,789,600	19,930
Nevada: Newlands	8	1	75,000	800,000	1,600
New Mexico: Carlsbad	12	1	25,000	100,000	300
New Mexico-Texas: Rio Grande	115	9	2,675,000	27,323,442	30,000
North Dakota: Williston	7	1	100,000	1,500,000	3,000
Oregon: Umatilla	9	1	25,000	300,000	1,200
Oregon-California: Klamath	11	5	350,000	4,200,000	8,200
South Dakota: Belle Fourche	9	6	150,000	2,145,000	5,000
Utah: Strawberry Valley	25	4	210,000	1,429,354	7,000
Washington:					
Okanogan	8	5	155,000	1,000,000	2,350
Yakima-Sunnyside	30	12	360,000	2,281,606	9,348
Yakima-Tieton	4				
Wyoming:					
Riverton	7	5	135,000	1,000,000	2,800
Shoshone	8	3	85,000	466,000	2,300
Total	621	157	10,977,936	106,637,208	214,298

# CROP STATISTICS

Summary of crop reports on Government reclamation projects in 1923 Area (acres)<sup>1</sup>

## CROP STATISTICS

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State and project	Cereals				Other grain and seed					Hay and forage					Total				
	Barley	Corn, In-	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	North grain	Flaxseed	Milliet seed	Total	Alfalfa hay	Clover hay		(Other hay	(Corn fodder	(Other forage	Pasture
Arizona: Salt River	11,186	972	3,008			36,664	14,774		4,477			14,774	49,485		484		17,631	58,957	128,317
Arizona-California: Yuma	455				1,516	1,971	15,395		1,428			19,872	21,915		480			4,444	26,839
California: Orland	617				1,139	7,766						1,428	6,212		316	30	91	4,299	10,948
Colorado: Grand Valley		876	582		915	2,373	170					170	5,316					312	9,737
Idaho: Uncompahgre	139	3,307	5,235		10,299	18,980	545					617	24,701	263	366	541	3,532	3,999	29,789
Idaho: Boise	3,175	9,800	2,650	210	26,900	42,735	1,020	6,000	40		17	7,677	38,523	8,150	95	700		6,425	53,893
King Hill	62	189	60	4		672	419	20				439	3,850	20	93	80		805	4,948
Mindokos																			
Gravity division	1,423	2,972	1,975	8	7,364	13,743	2	413				415	23,082	2,117	116	301		5,589	31,205
Pumping division	1,164	472	903		8,834	11,373	20	914				934	14,926	342	54	52	2	2,263	17,669
Montana:																			
Huntley	284	1,319	1,118	6	3,075	5,782	52	126				178	5,463	70	201	132		17,124	22,990
Milk River	84	453	812		1,707	3,066	185					213	3,399	4	11,687	160		228	15,978
Sun River																			
Fort Shaw division	89	104	397		819	1,409		10				10	5,225	104	140	26		909	6,404
Greenfields division	635	47	1,271		12,937	14,910		9				19	2,119	33	725	20		2,300	5,197
Montana-North Dakota: Lower Yellowstone	400	1,196	1,233		2,986	5,835	99					200	6,356	112	453	357	20	442	7,770
Nebraska-Wyoming: North Platte																			
Interstate division	5,175	21,054	4,947	148	4,928	36,152													
Fort Laramie division	1,499	8,208	5,277		4,245	19,329	180				175	355	25,471	299	324	195		2,613	28,872
Northport division							77				8	85	3,660	93	1,865	164		426	5,728
Nevada: Newlands	451		70		1,366	6,639					143	150	30,197	17	296		53		563
New Mexico: Carlsbad					3,116	3,637							30,117		180			5,690	35,967
New Mexico-Texas: Rio Grande	95				1,317	4,12	815					843	5,062					5,553	5,615
North Dakota: Williston	99	5,866	363	13	2,198	8,529	387					423	31,354		805	3,340		5,870	41,269
Oregon: Umatilla	10	267	3		106	326					1	1	9,972	39	292	61	153	1,109	11,204

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River, where data are for corresponding "agricultural year." October, 1922, to September, 1923.

<sup>2</sup> This report covers 13,622 acres irrigated from reclamation works, and 5,640 acres irrigated from private flood systems. Duty of water from reclamation canals 0.50 acre-foot per acre.

<sup>3</sup> Wheat and oats.

## Summary of crop reports on Government reclamation projects in 1923—Area (acres)—Continued

State and project	Cereals				Other grain and seed						Hay and forage					Total			
	Barley	Corn, In-	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Borgu grain	Flaxseed	Millet seed	Total	Alfalfa hay	Clover hay	Other hay		Corn fodder	Other forage	Pasture
Oregon-California:																			
Klamath—																			
Main division	537		1,224	545	2,618	4,924							14,986		1,061			10,044	26,091
Tule Lake division	49		30		335	414							154		120			49	33,332
South Dakota: Belle Fourche	949	8,826	4,591		1,379	15,745	331	82		26		441	26,768	272	592	120		5,799	33,551
Utah: Strawberry Valley	460	226	1,407		5,997	8,090	33	28				61	11,468		682	20	131	13,014	26,315
Washington:																			
Okanogan		15				15							500		38	9		60	607
Yakima—																			
Sunnyside division	253	5,398	479	67	4,828	11,025							37,945		1,725	137	433	6,982	47,122
Tieton division	453	934	300		1,618	3,305			87			87	10,275		614	60	168	2,000	13,126
Wyoming:																			
Shoshone—																			
Garland division	707	286	1,619		4,605	7,217	8	473			18	499	14,980	131	96	180		2,556	17,943
Frankie division	84	180	629		607	1,500	16	485			7	508	3,894		151	37		1,459	5,641
Total	30,759	77,154	41,281	1,046	137,680	287,920	34,278	9,576	6,004	147	394	50,399	438,240	12,066	23,754	9,953	22,274	166,503	669,790
State and project	Vegetables and truck					Fruits and nuts										Total			
	Beans	Onions	Potatoes (white)	Potatoes (sweet)	Truck	Total	Apples	Peaches	Pears	Prunes	Citrous fruit	Small fruit	Miscellaneous						
Arizona: Salt River	209		556		6,669	7,434								95	1,863			1,305	3,298
Arizona-California: Yuma	190				4,485	6,775												1,335	1,335
California: Orland	5				91	96	3	43	4	261	263	1	1,880					2,404	2,404
Colorado:																			
Grand Valley	550	8	819		174	1,551	178		67										245
Uncompahgre	837	1,391	9,079		510	11,817	1,893	87	7	1									2,068
Idaho:																			
Boise	105	130	7,600		2,360	10,225	1,420	145	30	680									2,470
King Hill		1	106		106	433	240	28	24	8								2	318
Minidoka-Gravity division	266	16	4,470		585	5,337	293												354
Pumping division	11	3	5,921		205	6,140													29

## CROP STATISTICS

[illegible]

Data are for calendar year (irrigation season) except on Salt River, where data are for corresponding "agricultural year," October 1922, to September, 1923.

\* Data are for calendar year (irrigation season) except, on Salt River, where data are for corresponding agricultural year, October 1964, to September, 1965.

Summary of crop reports on Government reclamation projects in 1923—Area (acres)<sup>1</sup>—Continued

State and project	Miscellaneous				Total cropped	Irrigated, no crop				
	Beets, sugar	Cotton	Cane	Other		Young alfalfa	Young fruit	Fall plowing	Miscellaneous	Duplicated
Arizona: Salt River		66,080		1,169	67,249		426		16,094	
Arizona-California: Yuma		22,110	20	263	22,393					
California: Orland						350	1,833	760	265	128
Colorado:										
Grand Valley	1,860			219	2,179		781	17	122	679
Uncompahgre	2,862			214	3,076		3,096	26	3,743	6,714
Idaho:										
Boise							1,860	600	1,100	266
Kling Hill							264	147		
Minidoka—										
Gravity division	4,582			44	4,626					
Pumping division	5,864				5,864					
Montana:										
Huntley	4,630			6	4,636					
Milk River	69									
Sun River										
Fort Shaw division	27				27					
Greenholds division	7									
Montana-North Dakota: Lower Yellowstone	3,110		48	36	3,194					75
Nebraska-Wyoming:										
North Platte—										
Interstate division	11,827		175	316	12,018					
Fort Laramie division	2,838		124	307	3,269					
Northport division	686		147		833					
Nevada: Newlands										
New Mexico: Candelaria		16,331	178		16,509					
New Mexico: Texas: Rio Grande	1	31,086	1,860	283	33,270					
North Dakota: Williston	7			1	8					
Oregon: Umatilla				44	44		27			
Oregon-California:										
Klamath							747	41	183	20
Main division										
Tule Lake division										
South Dakota: Belle Fourche	565			240	805					
Utah: Strawberry Valley	12,971			8,716	21,686					
						177	114		2,979	
									4,100	
									680	
									1,700	
									30,550	
									34,280	

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River, where data are for "agricultural year," October, 1922, to September, 1923.<sup>2</sup> This report covers 13,622 acres irrigated from reclamation works and 8,640 acres irrigated from private flood systems. Duty of water from reclamation canals, 0.60 acre-foot per acre.<sup>3</sup> Considerable area cropped without irrigation account excessive rainfall.<sup>4</sup> Owing to wet year, only about three-fifths land in crops received irrigation water.

Washington:													
Okanogan						470	4,560	18	571	12	9		6,100
Yakima—													
Sunnyside division	822	2,344	2,008	80,020	1,948				1,493	1,443	10,860	764	98,000
Tieton division	116	102	2,700	26,560	270				4,725		600	2,705	28,350
Wyoming:													
Shoshone—													
Garland division	1,925			30,130	431				15	78	29	223	30,460
Frankie division	209			8,090	185				7	81	103	276	8,190
Total	54,777	135,637	2,572	13,914	206,790	156,760	1,179,870	19,539	10,027	6,989	58,316	22,011	1,213,700

Summary of crop reports on Government reclamation projects in 1923—Total yields

State and project	Cereals					Other grain and seed					Hay and forage				
	Barley	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax seed	Millet seed	Alfalfa hay	Clover hay	Other hay	Corn fodder	Total
	Bush	Bush	Bush	Bush	Bush	Bush	Bush	Bush	Bush	Bush	Tons	Tons	Tons	Tons	Tons
Arizona: Salt River.....	397,000			571,408	1,909,275	29,548					292,701	21	683		292,722
Arizona-California: Yuma.....	10,800			31,615	42,415	66,367		124,260			53,881				54,576
California: Orland.....	12,000			2,500	14,500			77,600			28,100		420	94	28,964
Colorado: Grand Valley.....				18,424	53,285	400					14,985		43	848	15,874
Idaho: Uncompahgre.....	3,466	153,174		276,139	527,000	1,117	112				38,046	323	438	356	61,113
Idaho: Boise.....	98,425	106,000	3,960	1,008,780	1,771,065	5,100	39,600			340	138,683	13,040	285	8,400	160,408
King Hill.....	2,303	2,184	40	10,812	24,797	1,943	87				13,928	34	26	566	16,354
Minnesota: Gravity division.....	57,760	60,612	80	294,198	454,037	4	1,450				54,343	4,374	252	1,714	60,664
Pumping division.....	43,910	33,801		257,928	349,439	48	2,747				31,381	543	85	155	32,314
Montana: Huntley.....	7,263	30,049	60	99,265	137,209	52	361				11,428	79	186	437	12,130
Milk River.....	1,055	12,473		13,247	36,496	135			14	25	6,068	3	7,294	218	13,551
Sun River.....															
Fort Shaw division.....	2,452	10,649		11,654	27,640		50				7,233	93	107	100	7,533
Greenfield division.....	10,701	886		206,158	246,308		44				3,014	55	647	56	3,772
Montana-North Dakota: Lower Yellowstone.....	7,148	80,573	31,538	27,967	97,046	92				707	11,569	174	618	1,392	13,738

Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1922, to September, 1923.

## Summary of crop reports on Government reclamation projects in 1933—Total yields—Continued

State and project	Cereals					Other grain and seed					Hay and forage							
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax seed	Millet grain	Total	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage	Total
Nebraska—																		
North Platte—																		
Interstate division	Bush. 179,149	Bush. 424,536	Bush. 137,225	Bush. 1,553	Bush. 73,561	Bush. 815,024	Bush. 861	Bush. 861		Bush. 1,297	Bush. 1,297	Bush. 2,158	Tons 46,178	Tons 407	Tons 324	Tons 551	Tons 324	Tons 46,460
Fort Laramie division	Bush. 38,942	Bush. 223,770	Bush. 182,290		Bush. 51,556	Bush. 496,561	60			Bush. 48	Bush. 48	Bush. 108	Tons 6,347	Tons 141	Tons 1,223	Tons 503	Tons 141	Tons 8,214
Northport division	Bush. 7,885	Bush. 133,332	Bush. 30,042	Bush. 223	Bush. 17,813	Bush. 189,296	7			Bush. 1,717	Bush. 1,717	Bush. 1,724	Tons 418	Tons 15	Tons 183	Tons 85	Tons 15	Tons 701
Nevada: Newlands	Bush. 16,500		Bush. 2,812		Bush. 70,852	Bush. 90,164							Tons 84,555	Tons 193	Tons 193		Tons 85	Tons 85,048
New Mexico: Carlsbad		Bush. 966			Bush. 5,351	Bush. 6,317	396,994						Tons 14,139				Tons 14,139	Tons 14,139
New Mexico-Texas: Rio Grande	Bush. 2,805	Bush. 138,249	Bush. 8,809	Bush. 205	Bush. 42,056	Bush. 192,124	50,970		Bush. 570	Bush. 50	Bush. 56	Bush. 108	Tons 102,218	Tons 56	Tons 1,434	Tons 1,838	Tons 14,139	Tons 105,590
North Dakota: Williston	Bush. 247	Bush. 1,065	Bush. 1,640		Bush. 200	Bush. 3,152							Tons 767	Tons 56	Tons 315	Tons 290	Tons 315	Tons 1,368
Oregon: Umatilla	Bush. 280	Bush. 6,900	Bush. 125		Bush. 3,129	Bush. 10,434							Tons 36,343	Tons 99	Tons 99	Tons 511	Tons 99	Tons 36,953
Oregon-California:																		
Klamath—																		
Main division	Bush. 15,151		Bush. 37,984	Bush. 5,794	Bush. 36,522	Bush. 95,451							Tons 36,533	Tons 139	Tons 139	Tons 139	Tons 36,533	Tons 37,973
Tule Lake division	Bush. 1,570		Bush. 750		Bush. 3,595	Bush. 5,915							Tons 38,347	Tons 117	Tons 117	Tons 117	Tons 38,347	Tons 40,209
South Dakota: Belle Fourche	Bush. 20,358	Bush. 292,593	Bush. 105,926		Bush. 21,327	Bush. 440,349	92			Bush. 28	Bush. 28	Bush. 376	Tons 43,325	Tons 176	Tons 1,423	Tons 176	Tons 43,325	Tons 45,904
Utah: Strawberry Valley	Bush. 20,468	Bush. 6,172	Bush. 61,070		Bush. 210,298	Bush. 298,008	17,275						Tons 1,148	Tons 65	Tons 65	Tons 16	Tons 65	Tons 1,229
Washington:																		
Okanagan																		
Yakima—																		
Sunnyside division	Bush. 6,555	Bush. 232,154	Bush. 24,520	Bush. 997	Bush. 137,162	Bush. 401,888							Tons 160,486	Tons 3,013	Tons 3,013	Tons 1,010	Tons 160,220	Tons 160,220
Tieton division	Bush. 15,127	Bush. 35,138	Bush. 13,215		Bush. 48,555	Bush. 112,035		Bush. 479					Tons 30,400	Tons 928	Tons 928	Tons 201	Tons 30,400	Tons 33,583
Wyoming—																		
Shoshone—																		
Garland division	Bush. 18,385	Bush. 9,026	Bush. 48,884		Bush. 101,460	Bush. 177,735	28						Tons 33,000	Tons 113	Tons 79	Tons 984	Tons 33,000	Tons 34,186
Frankie division	Bush. 1,036	Bush. 3,602	Bush. 14,904		Bush. 6,768	Bush. 26,250	20						Tons 6,420	Tons 144	Tons 144	Tons 91	Tons 6,420	Tons 6,655
Total	998,715	2,461,802	1,735,680	12,942	3,552,391	8,546,530	570,283	49,270	202,430	820	3,988,826	700,128	2,268,212	19,567	22,607	20,566	12,183	1,373,110

Summary of crop reports on Government reclamation projects in 1923 1.—Total yields—Continued

State and project	Fruits and nuts							Total
	Apples	Peaches	Pears	Prunes	Citrus fruit	Small fruit	Miscellaneous	
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Arizona: Salt River	13, 600	64, 700	14, 000	835, 000	16, 144, 000		7, 530, 000	22, 974, 000
California: Orland	1, 342, 750		495, 100		360, 000			1, 968, 850
Colorado: Grand Valley	6, 094, 240	310, 450	26, 040	2, 820		145, 740		1, 827, 860
Idaho: Uncompahgre								6, 952, 260
Idaho: Boise	15, 620, 000	1, 450, 000	240, 000	5, 440, 000		1, 170, 000		26, 920, 000
King Hill	611, 800	135, 500	66, 600	16, 500		18, 000	4, 000	852, 400
Mindoka—	706, 014							
Gravity division								852, 274
Pumping division								47, 000
Montana: Sun River, Fort Shaw division						86, 200		2, 000
Nebraska-Wyoming: Northport division						2, 000		2, 000
New Mexico-Texas: Rio Grande								90
Oregon: Umatilla	3, 068, 610	633, 025	1, 222, 570	21, 000				4, 970, 705
Oregon-California: Klamath Main division	1, 382, 000	56, 450	62, 000	21, 500				1, 521, 950
Utah: Strawberry Valley							54, 490	54, 490
Washington: Okanogan	863, 700	2, 086, 200				107, 585		3, 007, 485
Yakima								
Sunnyside division	1, 003, 336	121, 650	369, 450	14, 240		137, 255		1, 645, 931
Tieton division	171, 342, 000	7, 921, 000	18, 581, 000					208, 490, 330*
Wyoming: Shoshone, Garland division	87, 642, 000	4, 594, 075	9, 900, 500	2, 847, 650		1, 065, 000	2, 498, 680	108, 107, 575
	12, 150					1, 500		13, 650
Total	289, 787, 200	17, 319, 550	31, 267, 320	8, 888, 800	15, 504, 000	2, 783, 340	11, 068, 160	376, 648, 370

\* Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year" October, 1922, to September, 1923.



## Summary of crop reports on Government reclamation projects in 1923—Total yields—Continued

State and project	Vegetables and truck				Miscellaneous			
	Beans	Onions	Potatoes, white	Potatoes, sweet	Total	Beets, sugar	Cotton	Cottonseed
	Bushels	Bushels	Bushels	Bushels	Bushels	Tons	Pounds	Pounds
Arizona: Salt River.....	2,000		46,333		48,423		26,048,800	52,037,600
Arizona-California: Yuma.....	3,950				3,950		7,638,560	13,880,000
California: Orland.....	50				50			
Colorado:								
Grand Valley.....	9,397	1,495	91,490		102,372	20,112		
Uncompahgre.....	11,022	499,360	1,441,005		1,941,387	27,983		
Idaho:								
Boise.....	2,100	65,000	1,440,000		1,507,100			
King Hill.....		4,000	66,182	333	70,515			
Minnesota:								
Gravity division.....	4,479	1,085	705,830		711,374	59,407		
Pumping division.....	225	1,000	1,039,045		1,040,270	69,986		
Montana:								
Huntley.....	945	256	4,720		5,921	62,213		
Milk River.....	405		6,804		7,209	554		
Sun River.....								
Fort Shaw division.....	317		25,492		25,809	219		
Greenfields division.....	3		7,746		7,749	40		
Montana-North Dakota: Lower Yellowstone.	3,988		47,221		51,209	32,638		120
Nebraska-Wyoming:								
North Platte—								
Interstate division.....	2,832		770,507		773,339	130,083		463
Fort Laramie division.....	1,595	6,008	172,512		179,115	56,160		274
Northport division.....	443		12,683		13,126	7,877		250
Nevada: Newlands.....		2,205	107,667		109,872			
New Mexico: Carlsbad.....				5,300	5,300		4,159,500	8,196,020
New Mexico-Texas: Rio Grande.....	9,340	14,328	790	19,751	44,212	5	12,613,750	24,016,400
North Dakota: Williston.....	408	45	2,326		2,779	71		7,297
Oregon: Umatilla.....			10,441		10,441			
Oregon-California:								
Klamath—								
Main division.....			49,385		49,385			
Tule Lake division.....			2,376		2,376			
South Dakota: Belle Fourche.....			20,018		20,018	7,123		
Utah: Strawberry Valley.....			51,637		51,637	69,137		

Summary of crop reports on Government reclamation projects in 1923. Total crop values

Summary of crop reports on Government reclamation projects in 1923												
Total crop values												
Cereals												
Other grain and seed												
State and project												
Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax- seed	Millet	Total	
Washington: Okanogan— Yakima— Sunnyside division. Tieton division.		7, 382		4, 645		4, 645						
				1, 473, 688		1, 481, 070		1, 696				
				246, 702		266, 792		715				
Wyoming: Shoshone— Garland division. Frankie division		6, 508	1, 000	232, 669		240, 177		21, 124				
		14		10, 174		10, 268		2, 060				
Total		67, 573	605, 436	8, 069, 494	25, 397	8, 787, 890	548, 162	50, 458, 610		98, 200, 420	8, 861	
Arizona: Salt River	\$312, 648	\$68, 040	\$139, 410		\$771, 408	\$354, 576					\$354, 576	
Arizona-California: Yuma	9, 175				38, 750	637, 120		\$111, 225			748, 345	
California: Orland	7, 800				2, 375	10, 175		77, 600			77, 600	
Colorado: Grand Valley		15, 463	9, 492		17, 037	3, 235					3, 235	
Idaho: Uncompahgre	3, 489	51, 027	72, 476		232, 558	359, 550					6, 905	
Idaho: Boise												
King Hill												
Minidoka—												
Gravely division	57, 086	415, 080	46, 640	\$2, 713	907, 000	48, 960	427, 680	3, 500	\$255		480, 385	
Pumping division	1, 688	7, 754	1, 211	40	10, 720	21, 413	18, 119	536			18, 662	
Montana: Hundley	43, 320	32, 494	27, 275	40	189, 645	322, 774	29	13, 060			13, 079	
Milk River—	32, 932	13, 800	15, 210		103, 446	255, 388	346	24, 723			25, 059	
Sun River—	3, 850	18, 818	15, 037	30	51, 200	88, 985	571	2, 024			2, 595	
Fort Shaw division	369	6, 986	4, 964		13, 324	25, 643	2, 088		\$28	60	2, 126	
Fort Shaw division	1, 516	3, 325	6, 283		10, 569	21, 693					240	
Greenfields division	6, 421	736	17, 138		185, 542	209, 337		240	41		262	
Montana-North Dakota: Lower Yellowstone	4, 288	18, 343	12, 543		26, 568	61, 742	1, 104	211	1, 484		2, 598	
Nebraska-Wyoming: North Platte—												
Interstate division	85, 992	212, 268	54, 890	839	38, 849	412, 838		6, 190		7, 782	13, 981	
Fort Laramie division	18, 692	111, 896	72, 915		41, 247	244, 740		432		346	778	
Northport division	3, 182	53, 338	10, 515	89	13, 360	80, 479	70			859	929	

Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1922, to September, 1923.

Summary of crop reports in Government reclamation projects in 1923—Total crop values—Continued

State and project	Cereals						Other grain and seed					
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax- seed	Millet	Total
Nevada: Newlands	\$12,705		\$1,631		\$74,385	\$88,721	\$53,315					\$53,315
New Mexico: Carlsbad		\$2,014	2,405		2,405	6,824	9,248					10,081
New Mexico-Texas Rio Grande	2,647	140,183	6,594	\$290	45,004	194,718			\$833			1,167
North Dakota: Williston	74	852	574		200	1,700				\$100	\$97	
Oregon: Umatilla	210	7,314	65		2,816	10,405						
Oregon-California: Klamath—												
Main division	12,727		19,448	4,172	52,571	88,918						
Tule Lake division	1,319		384		3,243	5,046						
South Dakota: Belle Fourche	9,168	175,496	33,964		20,601	240,251	1,002	\$2,313		70		3,265
Utah: Strawberry Valley	15,088	5,238	25,980		185,248	231,554	2,418	550				2,968
Washington: Okanogan						751						
Yakima—												
Sunnyside division	3,687	208,939	11,770		123,446	348,699						
Tieton division	9,833	26,354	5,947	847	42,720	84,854		5,664				5,664
Wyoming: Shoshone—												
Garland division	13,223	4,513	24,442		81,167	123,245	336	11,319			510	12,165
Frammie division	746	1,891	7,453		5,365	15,364	240	9,884			248	10,872
	673,875	1,653,760	646,665	9,060	3,277,879	6,261,239	1,139,147	505,337	193,188	1,723	10,127	1,849,492

## Summary of crop reports on Government reclamation projects in 1933—Total crop values—Continued

State and project	Hay and forage					Vegetables and truck							
	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage	Pasture	Total	Beans	Onions	Potatoes, white	Potatoes, sweet	Truck	Total
Arizona: Salt River	\$3,722,216		\$6,510		\$661,130	\$721,386	\$5,112,241	\$6,270		\$69,500		\$2,044,083	\$2,119,853
Arizona-California: Yuma	945,665		7,780			131,215	784,560	7,160				44,710	61,890
California: Orland	309,100		3,040	\$1,410	3,850	30,100	349,500	180				9,585	9,715
Colorado:													
Grand Valley	152,644		411	2,685		4,972	160,712	21,125	\$1,910	76,198		14,307	113,540
Uncompahgre	381,524	\$1,583	2,590	1,583	9,204	18,779	415,263	31,547	380,963	607,298		37,757	1,067,566
Idaho:													
Boise	1,040,114	97,800	2,137	50,400		128,500	1,318,961	6,300	78,000	722,000		207,926	1,114,225
King Hill	127,959	246	148	2,560		5,949	136,962		75	34,375	\$280	7,661	42,361
Minidoka													
Gravity division	434,741	34,991	1,265	23,705		63,017	539,719	17,916	1,917	352,915		28,311	406,069
Pumping division	252,242	4,344	425	1,550	252	25,735	284,546	900	1,900	519,522		12,785	594,907
Montana:													
Huntley	69,100	449	1,052	1,926	311	46,199	119,037	2,390	385	3,290		7,301	13,365
Milk River	52,428	18	61,965	1,305		1,140	116,856	1,215		5,710		3,565	10,490
Sun River													
Fort Shaw division	49,303	490	557	530		3,639	54,519	1,596			16,838	5,901	24,335
Greenfields division	24,112	275	3,587	294		2,390	30,658	15			5,422	3,596	9,033
Montana-North Dakota: Lower Yellowstone	92,550	870	3,090	8,904	600	2,669	108,683	9,970		28,322		10,655	48,967
Nebraska-Wyoming:													
North Platte													
Interstate division	316,244	1,628	3,240	826		20,904	342,842	7,080		346,728		15,398	369,206
Fort Laramie division	44,431	564	12,330	755		3,408	61,488	3,988	10,016	77,641		4,974	86,619
Northport division	848,546	88	1,101		425	41,583	892,059	1,329		6,341		2,096	10,708
Nevada: Newlands	247,417		1,960			10,660	258,107		1,544	96,900		74,226	172,604
New Mexico: Carlsbad	1,967,070		16,668	14,925		69,698	2,053,546	34,087	17,268	870	250	1,864	2,104
New Mexico-Texas: Rio Grande	9,204	504	3,800	1,300		1,564	16,492	1,224		1,866	23,517	510,260	596,022
North Dakota: Williston												4,730	7,991
Oregon: Umatilla												20,301	20,387
Klamath													
Main division	298,224		10,532			50,220	363,996					7,960	44,989
Tule Lake division	4,464		1,144			82	5,690						1,784
South Dakota: Belle Fourche	224,417	990	5,488	1,240		52,946	295,081			11,728		11,830	28,558
Utah: Strawberry Valley	356,723		8,459	1,056	15,305	40,674	422,217	469		27,355		74,052	102,476
Washington:													
Okanogan	13,776		650	160		1,010	15,596					15,470	18,287
Yakima													
Sunnyside division	1,730,037		34,650	5,050	57,590	139,634	1,965,961	22,146		884,213		246,791	1,163,160
Tieton division	364,800		7,424	603	12,324	30,000	415,151		14,479	110,749		16,500	141,728

Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1922, to September, 1923.



[illegible]

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1922, to September, 1923.

## ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

State and project	Lands on projects covered by crop census			Other lands served by Government works, usually a partial water supply through private canals under Warren Act contracts		
	Irrigable acreage <sup>a</sup>	Irrigated acreage	Cropped acreage	Crop value		Approximate percentage of total water used supplied by United States
				Total	Per acre	
Arizona: Salt River <sup>a</sup>	213, 170	204, 560	188, 070	\$18, 619, 130	\$92.00	
Arizona-California: Yuma	57, 500	53, 270	42, 800	4, 223, 400	79.61	
California: Orland	20, 670	16, 500	12, 420	637, 020	61.30	
Colorado:						
Grand Valley	20, 000	12, 870	12, 110	560, 000	46.25	
Uncompahgre	97, 060	64, 320	64, 010	2, 224, 710	34.76	
Idaho:						
Boise	120, 300	112, 500	108, 950	4, 474, 520	41.07	
King Hill <sup>a</sup>	16, 880	7, 080	6, 710	233, 820	34.84	
Minnesota: Gravity and pumping divisions <sup>a</sup>	121, 570	104, 470	97, 680	3, 453, 500	35.35	
Montana:						
Huntley	32, 000	18, 780	18, 780	783, 850	41.74	
Mile River <sup>a</sup>	97, 300	19, 270	18, 970	189, 970	8.33	
Sun River <sup>a</sup>						
Fort Shaw division <sup>a</sup>	42, 470	6, 470	8, 130	102, 990	12.67	
Greenfields division <sup>a</sup>		2, 620	20, 260	250, 180	12.35	
Montana-North Dakota: Lower Yellowstone <sup>a</sup>	58, 000	17, 860	17, 780	508, 620	28.50	
Nebraska-Wyoming: North Platte, Interstate, Fort Laramie and Northport divisions <sup>a</sup>	185, 340	128, 800	125, 910	2, 778, 380	22.05	
Nevada: Newlands	73, 730	44, 880	41, 180	1, 158, 450	28.06	
New Mexico: Carlsbad	25, 000	24, 060	23, 400	1, 781, 430	78.70	
New Mexico-Texas: Rio Grande	109, 060	92, 220	86, 940	7, 563, 230	86.95	
North Dakota: Williston	7, 650	1, 170	1, 180	27, 980	24.80	
Oregon: Umatilla	24, 470	13, 330	12, 350	428, 300	34.57	
Oregon-California: Klamath, Main and Tule Lake divisions	45, 300	37, 700	32, 920	512, 760	15.58	
South Dakota: Belle Fourche	81, 900	30, 550	50, 470	609, 470	12.12	
Texas: Strawberry Valley	53, 890	34, 280	31, 020	1, 414, 460	45.59	

[illegible]

<sup>1</sup> Data are for calendar year (irrigation season), except on Salt River project, where data are for corresponding "agricultural year," October, 1922, to September, 1923.

<sup>2</sup> Areas Bureau of Reclamation was prepared to supply water.

3 Irrigated crops. Excludes small areas on few projects cropped by dry farming.

• Data furnished by Salt River Valley Water Users' Association, which operates the project.

\* Includes 9,514 acres reported as vacant, 3,031 acres of "home tracts" and 3,548 acres within town sites, on which no crops were reported.

• Data furnished by King Hill Irrigation district.

7 Data furnished by King Hill irrigation district, which operated the division.

! Crop reports covered an additional area of 13,400 acres crooned by dry farming producing crops worth \$97,980, or \$7.32 per acre.

• Crop reports covered an additional area of 13,400 acres cropped by dry land farmers.

● Crop reports covered a small additional area cropped by dry farming.

10 Owing to excessive rainfall considerable area cropped without irrigation.

11 Figures are for 102 irrigated farms, which included 1 farm using water but not cropped.

<sup>12</sup> Crop reports covered an additional area of 14,800 acres cropped by dry farming, producing crops worth \$129,270, or \$8.74 per acre.

Does not include portion of exposed Tule Lake bed temporarily leased and cropped



# 194 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

## Summary of crop reports on reclamation projects in 1933

NOTE.—These figures are limited to irrigated crops covered by crop census on Government projects proper, excluding dry-farm crops, and all crops in most areas served stored water under the Warren Act.

Crop	Acreage cropped		Unit	Yields			Crop value	
	Total	Per cent of cropped		Total	Average per acre	Average per acre	Total	Per cent of total value of all crops
<b>Cereals:</b>								
Barley.....	30,759	2.6	Bushels.....	998,715	32	\$21.90	\$673,875	1.0
Corn (Indian).....	77,154	6.6	do.....	2,246,802	29	21.43	1,653,760	2.5
Oats.....	41,281	3.5	do.....	1,735,680	42	10.56	646,665	1.0
Rye.....	1,046		do.....	12,942	12	8.66	9,060	
Wheat.....	137,680	11.7	do.....	3,552,391	25	23.87	3,277,879	5.4
<b>Total.....</b>	<b>287,920</b>	<b>24.4</b>		<b>8,546,530</b>	<b>29</b>	<b>21.75</b>	<b>6,261,239</b>	<b>9.9</b>
<b>Other grain and seed:</b>								
Alfalfa seed.....	34,278	2.9	Bushels.....	570,282	16.6	33.23	1,139,147	1.7
Clover seed.....	9,576	.8	do.....	49,270	5.1	52.77	505,337	.8
Grain sorghum.....	6,004	.6	do.....	202,430	33.7	32.17	193,158	.3
Flaxseed.....	147		do.....	820	5.6	11.72	1,723	
Millet seed.....	394		do.....	8,988	10.1	25.70	10,127	
<b>Total.....</b>	<b>50,399</b>	<b>4.3</b>		<b>826,790</b>	<b>16.4</b>	<b>36.70</b>	<b>1,849,492</b>	<b>2.8</b>
<b>Hay and forage:</b>								
Alfalfa hay.....	438,240	37.1	Tons.....	1,298,212	2.9	33.00	14,527,492	22.3
Clover hay.....	12,066	1	do.....	19,567	1.6	12.08	145,744	.2
Other hay.....	23,764	2	do.....	29,607	.9	8.70	206,600	.3
Corn fodder.....	6,953	.6	do.....	20,566	3	19.52	135,742	.2
Other forage.....	22,274	2	do.....	10,158	.5	34.17	760,991	1.2
Pasture.....	166,503	14.1	do.....			10.20	1,698,813	2.6
<b>Total.....</b>	<b>669,790</b>	<b>56.8</b>				<b>26.00</b>	<b>17,476,382</b>	<b>26.8</b>
<b>Vegetables and truck:</b>								
Beans.....	5,228	.5	Bushels.....	67,573	13	37.00	193,402	.3
Onions.....	1,743	.1	do.....	605,436	347	292.90	610,519	.8
Potatoes, white.....	51,311	4.3	do.....	8,089,494	158	81.46	4,179,941	6.4
Potatoes, sweet.....	318		do.....	25,387	80	145.52	46,277	
Truck.....	21,146	1.9	do.....			16.89	3,571,592	5.5
<b>Total.....</b>	<b>79,746</b>	<b>6.8</b>				<b>106.61</b>	<b>8,501,731</b>	<b>13.0</b>
<b>Fruits and nuts:</b>								
Apples.....	26,617	2.2	Pounds.....	289,787,200	10,886	226.00	6,024,997	9.3
Peaches.....	2,168	.2	do.....	17,319,550	7,988	155.00	338,600	.5
Pears.....	4,582	.4	do.....	31,267,320	6,826	196.00	900,435	1.4
Prunes.....	1,379	.1	do.....	8,888,806	6,446	66.00	90,861	.1
Citrus fruit.....	2,155	.2	do.....	15,504,000	7,194	395.00	850,920	1.3
Small fruit.....	1,555	.1	do.....	2,783,340	1,789	298.60	463,042	.7
Miscellaneous.....	3,529	.3	do.....	11,098,160	3,145	193.00	683,326	1
<b>Total.....</b>	<b>41,985</b>	<b>3.5</b>		<b>376,648,370</b>	<b>8,971</b>	<b>223.00</b>	<b>9,352,371</b>	<b>14.3</b>
<b>Miscellaneous:</b>								
Sugar beets.....	54,777	4.7	Tons.....	548,162	10	78.04	4,274,852	6.6
Cotton.....	135,627	11.4	Pounds.....	50,458,610	372	123.46	16,745,231	25.8
Cotton seed.....				98,200,420	724			
Cane.....	2,572	.2	Tons.....	8,860	3.4	22.82	58,714	
Other crops.....	13,814	1.2				38.20	527,388	.8
<b>Total.....</b>	<b>206,790</b>	<b>17.5</b>				<b>104.50</b>	<b>21,606,185</b>	<b>33.2</b>
Duplication.....	156,760	13.3						
All crops.....	1,179,870	100.0				55.13	65,046,300	100.0

## Irrigable, irrigated, and cropped acreage, and crop value

Year	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value
1913.....	1,181,362	694,142	637,227	\$15,676,411
1914.....	1,240,875	761,271	703,424	16,475,517
1915.....	1,330,222	814,906	757,613	18,164,452
1916.....	1,405,452	922,821	858,291	32,815,972
1917.....	1,502,468	1,026,663	966,784	56,462,313
1918.....	1,601,934	1,119,566	1,051,193	66,821,396
1919.....	1,686,159	1,187,255	1,113,469	88,974,137
1920.....	1,661,960	1,225,480	1,153,820	66,171,650
1921.....	1,674,100	1,227,500	1,157,900	49,620,300
1922.....	1,692,700	1,202,130	1,169,100	50,360,850
1923.....	1,718,400	1,213,700	1,179,870	65,046,300

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U. S. DEPARTMENT OF THE INTERIOR

**ANNUAL REPORT OF THE  
COMMISSIONER OF RECLAMATION  
TO THE SECRETARY OF THE INTERIOR  
FOR FISCAL YEAR ENDED JUNE 30, 1925**



DEPARTMENT OF THE INTERIOR  
HUBERT WORK, SECRETARY  
U. S. BUREAU OF RECLAMATION  
ELWOOD MEAD, Commissioner

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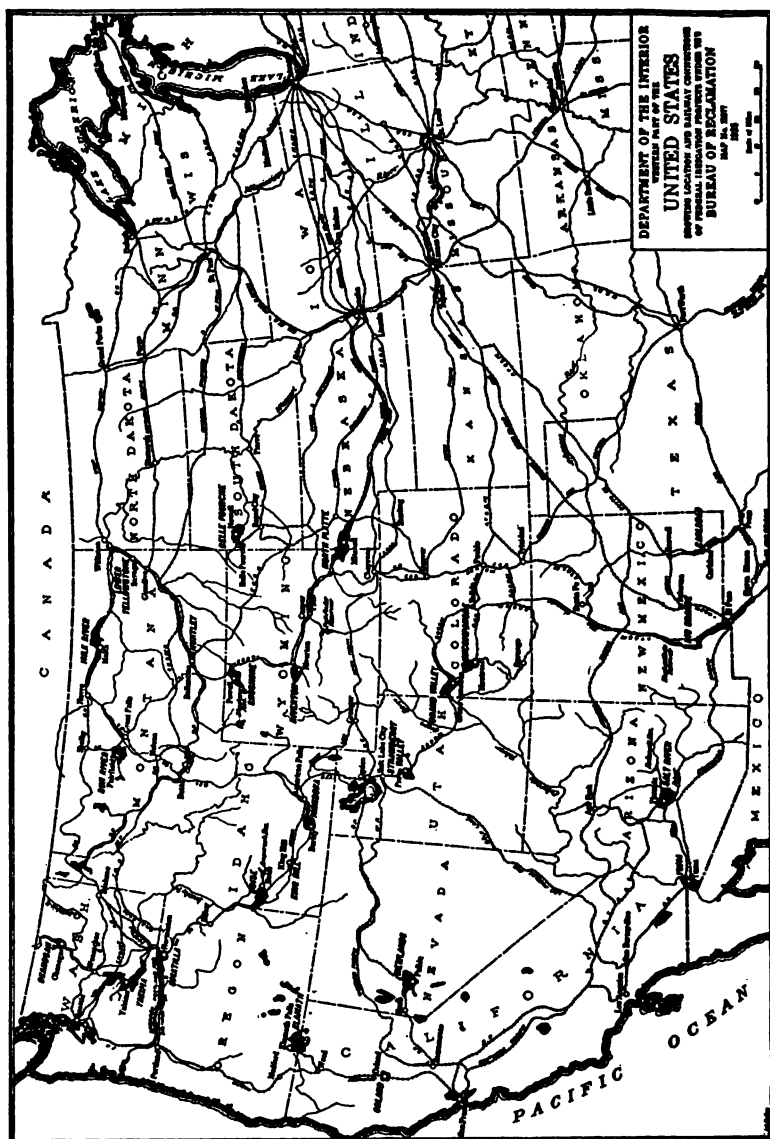
TWENTY-FOURTH ANNUAL REPORT  
OF THE  
BUREAU OF RECLAMATION

Transmitted to Congress in pursuance of the  
Act of June 17, 1902 (32 Stat. 388)

FOR THE  
FISCAL YEAR ENDED JUNE 30, 1925



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1925



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# TWENTY-FOURTH ANNUAL REPORT OF THE BUREAU OF RECLAMATION

DEPARTMENT OF THE INTERIOR,  
BUREAU OF RECLAMATION,  
October 14, 1925.

SIR: The land irrigated from Federal reclamation works in 1924 produced crops worth nearly \$110,000,000. This is an increase from the previous year of more than \$7,000,000. The value of the crops grown in 1925 will be considerably greater than in 1924. This will result from the increase in the cultivated acreage and the improvement in prices.

Another evidence of economic improvement is the large number of factories and extensions of old industries on nearly all the projects. The following is a partial list:

*Yuma project, Arizona-California.*—The two old ice plants each increased their activities from 157 tons to 275 tons per 24 hours, most of which is purchased by the Pacific Fruit Express Co. for icing cars. The icing shed was extended to 3,080 feet, which permits icing facilities for 140 cars at one time.

*Grand Valley project, Colorado.*—Two creameries and a cannery were established. In addition, industries operated during the year comprised 4 creameries and stations, 2 flour mills, 1 sugar factory, 3 canneries, 2 packing houses, the beet growers' association, the Colorado Potato Growers' Exchange, the farm bureau, and a cow-testing association.

*Boise project, Idaho.*—A canning factory was established at Wilder and a new creamery and a cold-storage plant for handling poultry and eggs at Caldwell.

*Minidoka project, Idaho.*—A new creamery was established and two cooperative associations organized—the Idaho-Oregon Poultry Producers' Association and the Cassia County Beet Growers' Association.

*Huntley project, Montana.*—An egg-marketing association was organized.

*Milk River project, Montana.*—The erection of a sugar factory at Chinook was commenced early in 1925. A seed potato marketing association, which formerly did not embrace project lands, is increasing its activities, and a small acreage of seed potatoes will be grown on the project in 1925.

*Lower Yellowstone project, Montana-North Dakota.*—A cheese factory was established at Fairview. A beet-sugar factory was being erected at Sidney to handle the 1925 crop. Salting stations for pickles were being erected at Savage, Sidney, and Fairview.



*North Platte project, Nebraska-Wyoming.*—A cheese factory was established north of Minatare, the product being handled by an Omaha commission company. The South Sioux Poultry Association was organized by farmers on the Interstate division and is meeting with success.

*Carlsbad project, New Mexico.*—Three cotton gins were built during the year.

*Rio Grande project, New Mexico-Texas.*—Twenty cotton gins are in operation on the project, as well as a large cotton mill and two cottonseed-oil mills. A cooperative dairy association has been established, and a butter and ice-cream factory. Other organizations comprise alfalfa-hay associations, cotton associations, and poultry organizations.

*Belle Fourche project, South Dakota.*—Pickle-salting stations have been erected and the industry began with record yields of cucumbers that brought the growers as high as \$450 per acre in 1925.

*Strawberry Valley project, Utah.*—A large canning factory was constructed near Spanish Fork City by the Utah Packing Corporation, a subsidiary of the California Packing Co.

*Okanogan project, Washington.*—A creamery was established during the year.

*Shoshone project, Wyoming.*—A portable alfalfa-meal mill was erected.

There are other hopeful indications. More acres are under cultivation. Yields in 1925 promise to be excellent, and prices are satisfactory. The value of the cotton crop on the Rio Grande project is estimated at \$12,000,000, which almost equals the cost of the works. The cherry crop on the Yakima project brought \$700,000, and the entire crop of the Yakima Valley, which includes the project, is expected to bring \$40,000,000. A considerable part of this crop is marketed by 16 cooperative organizations. The beet-sugar factory built this year on the Lower Yellowstone project is adding to the acres irrigated and improving methods of tillage. On nearly all projects helpful influences are lessening the financial tension under which reclamation farmers have struggled for the past three or four years.

In the following table the farms on the projects are classified, in accordance with the crop results obtained, into poor, fair, good, and average. By "poor" is meant a crop yield on a farm less than one-half the average for the project as a whole; by "fair" a yield one-half the average but less than the average for the project; by "good" a yield equal to the average but less than one and one-half times the average for the project; and by "excellent" a yield one and one-half or more times the average of the project.

*Crop results, 1924, on irrigation projects*

State	Project	Poor		Fair		Good		Excellent	
		Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent
Arizona.....	Salt River.....	63	1.0	4,095	65.0	1,890	30.0	252	4.0
Arizona-California.....	Yuma.....	225	17.9	475	37.8	535	42.6	21	1.7
California.....	Orland.....	153	25.1	211	34.6	137	22.4	109	17.9
Colorado.....	Grand Valley.....	50	12.4	203	50.2	103	25.5	48	11.9
Do.....	Uncompahgre.....	370	23.2	664	41.5	330	20.6	235	14.7
Idaho.....	King Hill.....	38	20.2	56	29.8	67	35.7	27	14.3
Do.....	Minidoka:								
	South side.....	161	18.4	376	42.9	249	28.4	90	10.3
	Gravity.....	127	9.0	593	42.0	494	40.0	198	14.0
Idaho-Oregon.....	Boise.....	540	20.0	1,081	40.0	811	30.0	270	10.0
Montana.....	Huntley.....	144	25.6	166	29.5	146	25.9	107	19.0
Do.....	Milk River <sup>1</sup> .....	89	25.4	90	25.8	67	19.1	104	29.7
Do.....	Sun River.....	47	9.4	215	43.1	168	33.7	69	13.8
Montana-North Da- kota.....	Lower Yellowstone.....	130	22.5	237	41.1	169	29.3	41	7.1
Nebraska-Wyoming.....	North Platte.....	987	43.5	558	24.5	352	15.5	377	16.5
Nevada.....	Newlands.....	215	28.2	200	26.2	300	39.4	47	6.2
New Mexico.....	Carlsbad.....	61	14.8	132	32.0	170	41.3	49	11.9
New Mexico-Texas.....	Rio Grande.....	824	20.0	824	20.0	2,059	50.0	412	10.0
Oregon.....	Umatilla.....	68	12.8	216	40.4	174	32.6	76	14.2
Oregon-California.....	Klamath.....	70	14.4	185	38.2	200	41.2	30	6.2
South Dakota.....	Belle Fourche.....	166	21.4	380	49.3	129	16.8	96	12.5
Utah.....	Strawberry Valley.....	200	9.0	1,500	67.4	500	22.5	24	1.1
Washington.....	Okanogan.....	168	45.5	72	19.4	52	14.0	78	21.1
Do.....	Yakima:								
	Sunnyside.....	1,000	29.4	1,000	29.4	1,000	29.4	391	11.5
	Tieton.....	147	11.3	555	42.7	434	33.3	165	12.7
Wyoming-Montana.....	Shoshone.....	166	20.3	343	41.8	168	20.5	143	17.4
	Total.....	6,208	17.8	14,427	41.5	10,705	30.8	3,459	9.9

<sup>1</sup> Exclusive of Chinook division.

In general the table calls attention to the larger percentages of good and excellent yields on the farms in the Southwest and the Pacific Coast States, where cotton and fruit predominate. It also indicates that even on those projects where the worst agricultural and economic conditions prevail, there is an appreciable percentage of settlers who produce crops well above the average for the project.

This favorable financial outlook leads the bureau to believe that the time has come for constructive action in improving certain social and economic conditions on reclamation projects. The foremost of these is the closer settlement of the land on certain existing projects by farmers who will be owners and able to cultivate the land intensively, which is the only way that success in irrigation can be achieved. On several of the projects where water has been supplied for more than 10 years, less than half of the fertile soil is being cultivated by irrigation. On several projects more than half of the land is being cultivated by tenants who lack capital and the incentive which ownership gives to properly develop the farms and create the most satisfactory social conditions. On a number of projects tracts are held by individuals largely in excess of the farm unit established by law. During the agricultural depression through which we have passed, subdivision could not be insisted upon because purchasers could not be found. Now that better times seem to have come, this disregard of the law should cease.

## THE FINANCIAL SITUATION AND MEASURES FOR ITS IMPROVEMENT

During the last five years, on one-third of the Federal reclamation projects, there has been a progressive falling off in payments due the Government from water users. Delinquencies on all projects for this brief period amount to the staggering total of \$8,652,000. In 1924 it increased over \$3,000,000. Some projects have paid all their assessments while others have paid practically nothing.

These delinquencies fall into two groups. In the first, water users are unable to pay from causes beyond their control, such as poor soil or inadequate water supply which cut down earning power of the land regardless of the efforts of the settler. In the second, conditions can be controlled. On some projects large areas of fertile land are either not farmed at all or very poorly farmed, while on prosperous farms, water users amply able to pay, do not because they lack the desire and because of a belief that delinquencies will be funded into deferred construction payments.

Efforts to improve these conditions are being made. Investigations are in progress to determine the areas of land unfit for cultivation or for which a water supply is lacking or inadequate. When these have been concluded, recommendations will be made to Congress for charging off money which can not be collected and for temporary suspension of charges which settlers are at present unable to pay. Plans for the closer settlement and better cultivation of neglected areas are being worked out. Where payment of delinquencies is reasonably possible this is being insisted upon.

The accompanying tables show the financial condition of the various projects. Two give the assessments for construction and operation for the year 1924, due on June 30, 1925, and the payments made on these assessments. The other two give similar assessments and payments for the five-year period, 1920 to 1924, inclusive.

*Construction water-right charges due for the year 1924, charges paid and uncollected, and percentages paid*

Project	Charges due	Paid	Uncollected June 30, 1925	Per cent paid
Salt River.....	\$809,961.32	\$809,961.32	-----	100.0
Rio Grande.....	153,714.60	153,714.60	-----	100.0
Klamath.....	64,749.76	63,773.81	\$975.95	98.5
Carlsbad.....	58,099.37	44,712.81	13,386.56	77.0
Yuma.....	302,300.99	224,720.47	77,580.52	74.3
Yakima.....	393,980.45	249,209.87	144,770.58	63.3
Orland.....	66,552.92	36,757.03	29,795.89	55.2
Newlands.....	62,063.65	32,912.61	29,151.04	53.0
Huntley.....	32,149.01	16,067.47	16,091.54	49.9
Strawberry Valley.....	155,390.08	66,551.35	88,838.73	42.8
Sun River.....	15,679.91	5,964.54	9,695.37	38.2
Minidoka.....	330,634.61	98,597.91	232,036.70	29.8
Uncompahgre.....	112,183.03	24,174.34	88,008.69	21.5
Boise.....	693,241.07	119,917.88	573,323.19	17.3
Belle Fourche.....	137,112.28	19,582.23	117,530.05	14.2
Shoshone.....	110,979.22	8,406.14	102,573.08	7.6
North Platte.....	443,896.69	26,588.67	417,308.02	6.0
Umatilla.....	41,571.55	1,127.56	40,443.99	2.7
Okanogan.....	11,403.67	68.88	11,334.79	.6
King Hill.....	40,000.00	-----	40,000.00	-----
Lower Yellowstone.....	27,981.40	-----	27,981.40	-----
Williston.....	5,816.07	-----	5,816.07	-----
Total.....	3,869,461.65	1,802,821.49	2,066,640.16	46.6

*Operation and maintenance charges due for the year 1924, charges paid and uncollected, and percentages paid*

Project	Charges due	Paid	Uncollected June 30, 1925	Per cent paid
Rio Grande.....	\$162,591.53	\$162,591.53	-----	100.0
Grand Valley <sup>1</sup> .....	51,929.83	49,109.50	\$2,820.33	94.6
Milk River <sup>1</sup> .....	17,007.43	15,694.59	1,312.84	92.3
North Platte (Fort Laramie) <sup>1</sup> .....	61,608.09	53,899.24	7,708.85	87.5
Orland.....	33,276.44	28,509.00	6,766.84	79.7
Carlsbad.....	51,227.06	40,571.49	10,655.57	79.2
Sun River (Greenfields) <sup>1</sup> .....	17,638.46	13,322.03	4,316.43	75.5
Yuma.....	312,800.53	219,640.87	93,219.66	70.2
Yakima.....	261,362.85	171,385.23	89,977.62	65.6
Huntley.....	36,268.99	23,133.44	13,135.55	63.8
Minidoka.....	124,173.10	77,041.47	47,131.63	62.0
Newlands.....	117,514.50	62,565.72	54,948.78	53.2
Strawberry Valley.....	41,337.00	20,833.35	20,503.65	50.4
Uncompahgre.....	137,929.56	67,417.57	70,511.99	48.9
Sun River (Fort Shaw).....	11,994.57	5,200.01	6,794.56	43.4
Belle Fourche.....	76,285.48	22,771.80	53,513.68	29.9
Shoshone.....	51,272.47	15,080.82	36,191.65	29.4
Boise.....	164,134.74	41,131.60	123,003.14	25.1
North Platte (excluding Fort Laramie).....	207,169.79	50,927.70	156,242.09	24.6
King Hill.....	30,654.98	4,527.50	26,127.48	14.8
Klamath.....	37,756.47	3,443.77	34,312.70	9.1
Umatilla.....	19,594.84	231.13	19,363.71	1.2
Okanogan.....	24,407.50	157.50	24,250.00	.6
Lower Yellowstone.....	42,335.12	-----	42,335.12	-----
Williston.....	14,600.43	-----	14,600.43	-----
<b>Total.....</b>	<b>2,106,931.76</b>	<b>1,147,187.46</b>	<b>959,744.30</b>	<b>54.4</b>

<sup>1</sup> On water rental basis.*Construction charges due, paid, and uncollected, for 5-year period 1920-1924*

Project	Charges due	Charges paid	Uncollected June 30, 1925	Per cent paid
Salt River.....	\$1,696,222.64	\$1,696,222.64	-----	100.0
Rio Grande.....	472,345.20	472,345.20	-----	100.0
Klamath.....	267,328.30	263,866.28	\$3,462.02	98.7
Carlsbad.....	280,665.81	266,660.00	14,005.81	95.0
Orland.....	288,395.98	258,600.09	29,795.89	89.7
Yuma.....	1,066,280.74	962,049.21	124,181.53	88.6
Yakima.....	1,902,955.10	1,647,967.58	254,987.52	86.6
<b>PROJECTS WHICH HAVE PAID LESS THAN 65 PER CENT</b>				
Newlands.....	237,812.64	185,736.34	52,076.30	78.1
Strawberry Valley.....	591,162.55	383,007.92	208,154.63	64.8
Huntley.....	141,240.55	89,401.50	51,839.05	63.3
Minidoka.....	1,508,971.04	923,056.31	585,914.73	61.2
Sun River.....	58,376.53	34,689.01	23,687.52	59.4
Okanogan.....	36,065.74	19,218.69	16,847.05	53.3
Boise.....	2,402,012.37	1,170,276.48	1,222,735.89	49.1
Umatilla.....	282,388.52	104,842.37	177,546.15	37.1
North Platte.....	1,964,223.13	701,889.67	1,262,333.46	35.7
Uncompahgre.....	370,587.54	121,064.15	249,523.39	32.7
Shoshone.....	496,964.84	161,732.62	335,232.22	32.5
Lower Yellowstone.....	60,725.26	9,530.62	51,194.64	15.7
Belle Fourche.....	593,787.80	80,789.84	512,997.96	13.6
King Hill.....	40,000.00	-----	40,000.00	-----
Williston.....	5,816.07	-----	5,816.07	-----
<b>Total.....</b>	<b>14,784,978.35</b>	<b>9,562,646.52</b>	<b>5,222,331.83</b>	<b>64.7</b>

<sup>1</sup> \$331,615.52 deferred to be paid as supplemental construction.

NOTE.—Grand Valley project, Milk River project, Greenfields division of Sun River project, and Fort Laramie division of the North Platte project on water-rental basis. No construction charges assessed.

*Operation and maintenance charges due, paid, and uncollected, for 5-year period 1920-1924*

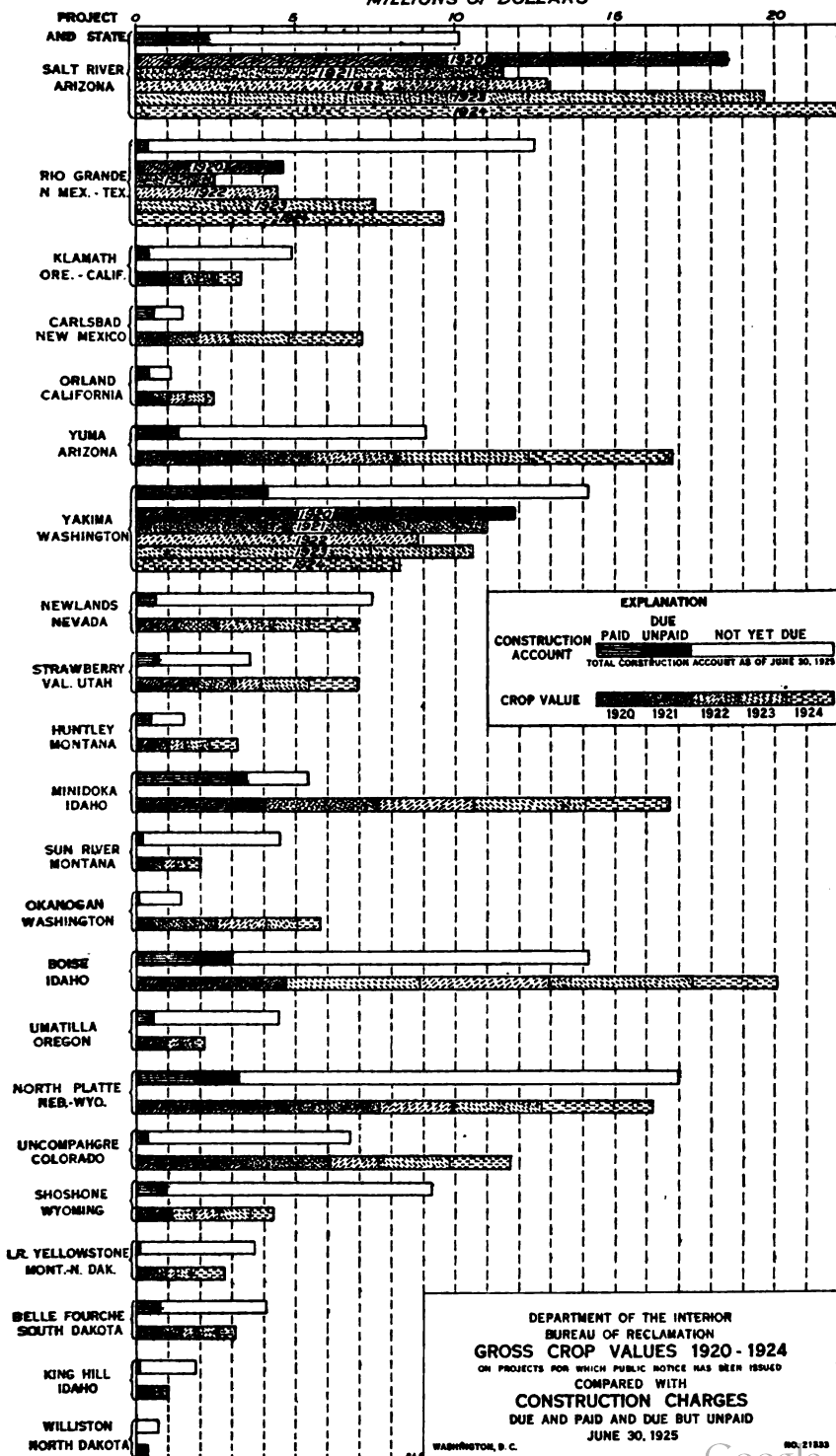
Project	Charges due	Charges paid	Uncollected June 30, 1925	Per cent paid
Rio Grande.....	\$809,145.80	\$802,057.94	\$7,087.86	99.1
Orland.....	187,654.75	180,887.91	6,766.84	96.4
North Platte: Fort Laramie <sup>1</sup> .....	219,047.00	211,042.00	8,005.00	96.3
Carlsbad.....	273,811.45	262,709.84	11,101.61	96.0
Grand Valley <sup>1</sup> .....	255,040.00	227,997.00	27,043.00	89.4
Klamath.....	306,983.70	271,770.18	35,213.52	88.5
Yuma.....	1,386,997.72	1,216,753.54	170,244.18	87.7
Yakima.....	1,307,430.11	1,141,232.54	166,197.57	87.3
Milk River <sup>1</sup> .....	109,855.00	95,218.00	14,637.00	86.7
PROJECTS WHICH HAVE PAID LESS THAN 85 PER CENT				
Strawberry Valley.....	260,275.22	207,540.66	52,734.56	79.7
Newlands.....	565,733.97	449,729.51	116,004.46	79.4
Okanogan.....	221,188.20	172,703.12	48,485.08	78.1
Umatilla.....	184,284.20	135,701.22	48,582.98	73.6
Minidoka.....	794,855.72	561,678.87	233,176.85	70.7
Boise.....	1,412,782.70	959,907.37	452,875.33	67.9
Sun River: Fort Shaw.....	71,221.78	44,668.43	26,553.35	62.7
Huntley.....	251,516.61	156,419.31	95,097.30	62.2
Sun River: Greenfields <sup>1</sup> .....	66,573.00	33,728.66	27,844.34	58.2
Uncompahgre.....	295,046.36	164,923.22	130,123.14	55.9
King Hill.....	124,951.23	60,551.12	64,400.11	48.5
North Platte.....	1,054,253.27	490,063.87	564,189.40	46.5
Shoshone.....	359,494.33	154,245.49	205,248.84	42.9
Belle Fourche <sup>1</sup> .....	562,519.83	80,864.02	475,655.81	15.4
Williston.....	191,058.07	16,578.58	174,481.49	8.7
Lower Yellowstone.....	254,909.55	16,881.31	238,028.24	6.4
*Total.....	11,526,639.57	8,096,349.71	3,430,279.86	70.2

<sup>1</sup> Project on water-rental basis.    <sup>2</sup> \$396,660.89—deferred to be paid as supplemental construction.

These tables show that for 1924 less than half of what was due on construction and only 54 per cent of what was due for operation and maintenance was paid by water users. This is a serious situation. The causes of these delinquencies need to be understood by all who believe in Federal reclamation and desire to see it continued. Why, for example, should seven projects pay more than 85 per cent of all the Government's charges during the five-year period of agricultural depression, while six paid less than half of the charges assessed for operating them during that period? Last year the Rio Grande project paid all it owed the Government while the Lower Yellowstone and Williston projects paid nothing. Why for 1924 should five projects pay from nothing to less than 10 per cent of the charges assessed for supplying irrigators with water? Efforts to collect from these projects have disclosed the reasons for these wide discrepancies.

On some projects there has been real distress, but these are not the projects where least payments were made. There are others where powerful influences seek on various pretexts to evade paying. On one project the water users organization in an appeal for blanket deferment said: "Not one irrigator on this project can pay anything." This request was denied but water users were told that individual applications showing the reasons for nonpayment would be carefully considered. Thousands of dollars came at once into the reclamation treasury from those who could not make such a showing. One applicant asked for two years' deferment on a water charge of \$7.50, which only required a cash installment of \$1.50. On another project owners of fine farms with the best crops in years refused to pay a cash install-

MILLIONS OF DOLLARS



ment of \$15 on last year's operating charges. One who had paid asked to have his money refunded because others equally able were not paying.

During the year a few collection suits were started. Not one came to trial. The promptness with which water charges varying in amount from more than \$1,500 to nearly \$10,000 were paid showed that they could readily have been paid in the four or five years they had been accumulating.

This is the sordid, unhappy side of reclamation finances. It grows out of the mistaken mental attitude that water users on Federal projects are "children of the Government." What is needed is discrimination between this class and the hundreds of worthy, struggling settlers who are entitled to sympathetic consideration.

The worthy settler is not helped by laxness in collections. When 40 per cent of the water users on a project pay their charges we are obligated to them to find out why the other 60 per cent refrain from paying, and equally obligated to insist on payments from those in a similar position. That is what was attempted this year. Altogether too many cases were disclosed where no payments have been made for years by people amply able to pay but who have evaded payment.

Failure to enforce collection of charges for operation and maintenance expenses is the outstanding reason why less than one-fourth of the land on one project is being irrigated. The owners of the unirrigated three-fourths do not have to act as long as it costs nothing to own land in an irrigated area. This explains why the lands under some canals have never contributed to operating costs. This condition prevails on projects with good soil, plenty of water and favoring climate. Rigid collections of charges for operation and maintenance expenses would soon put an end to untilled fields and unoccupied farms.

On a number of these projects more than half of the land is held by nonresident owners and cultivated by tenants. Failure to collect water charges does not help the tenant cultivator. The benefit of laxness goes to the nonresident owners, some of whom are men of large means. Confidence is felt that an understanding of the financial situation on these projects will result in a great increase in payments.

### THE DANGERS OF MORATORIUMS

During 1921, 1922, and 1924, projects having large delinquencies urged Congress to grant moratoriums on past due debts, and laws were passed permitting postponement of such payments. The purpose of Congress was commendable, but there is no question that these acts have worked injustice to the debt paying water user, and have demoralized reclamation finances. These measures did not provide proper consideration for the water user who at great sacrifice had paid the Government charges. Relief was extended only to such water users as had not paid. If the failure to meet these payments was due to causes beyond the water user's control, this discrimination in favor of the nondebt payer would not have caused ill feeling, but when the hard-working settler, often with a large family of children, has paid his assessment and learns that a banker on the same project who owns several farms, is given a moratorium, he

feels that he has been wronged, that political pull counts, and he joins the opposition to collections.

Although these acts permitted blanket moratoriums; that is, all who owed the Government secured general postponement, no refund of money was provided to equally poor and equally deserving water users who had with great sacrifice made their payments. The result has been a lowered morale and a dangerous increase in the repudiation ranks.

An effort has been made to inform water users of the financial situation and to bring about the prompt payment of current operation and maintenance charges. In all private irrigation enterprises, such charges must be collected in advance because that is the only way in which money for operation can be secured. Congress has indicated clearly that advance operation payments should be required on reclamation projects and this is being brought about as rapidly as possible.

As the first step toward this, water users were advised early in the present year that thereafter no blanket deferment of payments would be granted to those who were in arrears; but that relief, where granted, would be to individuals, and only on a satisfactory showing by the individual, that he was unable to pay. It was felt that the settler who was living on the land and cultivating his own crops was entitled to more sympathetic consideration than the nonresident landowner whose farms were cultivated by tenants or the owner of tracts of land in excess of the homestead unit.

The law authorizing deferments, passed in 1924, permitted carrying over to 1925, 1926, and 1927, the debts of those who were delinquent for charges due prior to March, 1924, with reduction of penalty from 12 to 5 per cent per annum. For the time being this eliminated all arrears on approved applications. An earlier law provides that charges must be more than one calendar year in arrears before delivery of water can be withheld. This explains the reason for the small collections of construction charges on seven of the projects and of operation and maintenance charges on five of them in 1924. Many settlers, although not compelled to pay, voluntarily chose to do so, and this explains the payments on some projects where a moratorium on all arrears had been granted.

The granting of relief only on satisfactory individual showings imposed on the bureau the most difficult and exacting duty it has been required to perform since Federal reclamation began. Thousands of individual applications were filed. All these had to be considered by project officials and reviewed in Washington. They showed that many were entitled to sympathetic consideration; but they also uncovered many grave abuses. Water users amply able to pay had for four, five, or six years paid nothing. Some had private debts requiring interest payments which were given preference. A strong local sentiment exists on some projects in favor of keeping the money at home rather than paying it to the Government and taking it from the community. How extensive these credit transactions of the bureau have been is shown by the fact that the deferred payments granted under the operation of the so-called relief or deferment act of 1924, amount in the aggregate to \$4,837,000.



## Relief granted under the act of May 9, 1924

Project	Sec. 1				Sec. 2				Total
	Individual relief		Blanket relief		Individual relief		Blanket relief		
	Construction charges	Operation and maintenance charges	Water-rental charges	Construction charges	Operation and maintenance charges	Construction charges	Operation and maintenance charges		
Salt River.....	\$38,479.69	\$39,470.95				\$1,965.54	\$612.00	\$539,602.90	
Yuma.....			\$22,107.28					70,528.18	
Grand Valley.....	71,400.15	57,719.64	24,710.38					22,107.28	
Uncompahgre.....				\$175,651.14	\$69,289.52			398,770.83	
King Hill.....					38,272.63			38,272.63	
Minidoka.....	11,778.66	1,143.90		360,510.94	191,080.15			564,513.45	
Boise.....				670,527.57	346,843.18			1,017,370.75	
Huntley.....	11,737.24	27,194.43						38,931.67	
Lower Yellowstone.....	10,406.65	87,754.99						98,161.64	
Milk River.....			8,539.61					8,539.61	
Sun River.....	12,825.37	17,764.31	18,365.08					48,654.76	
North Platte.....				751,044.04	455,872.68			1,208,916.72	
Newlands.....	11,377.88	29,321.87				8,118.56	12,800.74	61,619.05	
Carlsbad.....	476.76	1,465.60						1,942.36	
Belle Fourche.....				74,282.96	55,666.62			129,949.58	
Strawberry Valley.....	109,355.64	28,255.79				9,338.50	2,275.75	149,235.85	
Okanogan.....	51,549.90	20,053.16					84.00	18,038.28	
Yakima.....	170,132.89	93,696.07		34,269.31	43,824.72			159,707.09	
Shoshone.....								263,828.96	
Total.....	499,521.03	403,850.71	73,722.35	2,096,285.76	1,200,849.50	19,422.60	15,772.49	4,836,980.92	
Construction charges.....								\$3,127,422.29	
Operation and maintenance charges.....								1,635,856.28	
Water-rental charges.....								73,722.35	

Whatever Congress may decide to do about granting deferments on construction charges, nothing should interfere with authority to require annual payments of operation and maintenance charges on every project more than five years old. Operating these projects with money taken from the reclamation fund is unfair to irrigators of private projects, who have furnished the money to build their works and must pay annually all their expenses. It is also unfair to the great body of farmers throughout the country who have neither aid nor subsidy in their farming operations. It has created a tendency to make the Bureau of Reclamation not an organization for service, but a credit agency that should not seek to collect its charges until other pressing obligations of water users have been met. No Government enterprise can be administered on this basis and on none other is there any thought of doing so. Letters are not carried free by the Post Office Department because it is inconvenient for the sender to buy a stamp. People do not travel on Government-owned ships without paying for transportation because they can ill afford the money required. The Government operation of reclamation projects can not continue unless operation and maintenance expenses are paid yearly and in full and they should be paid in advance.

Insistence on payment of charges during the past year has led to the collection of hundreds of thousands of dollars that otherwise would not have been paid. Instead of discouraging water users, it has increased the confidence of those who have paid and endeavor to pay, and it has helped to maintain the morale of this bureau. There was only one instance of active resistance. This occurred on a project where the payment of a small charge for drainage was required. Other charges aggregating over three quarters of a million dollars had been postponed. After several months of negotiation without securing an agreement, notice was given that the payment of this charge must be made, but that it could be paid in five monthly installments, beginning July 1. The notice stated that if the first of these installments was not paid on that date, water would be shut off. There was considerable objection on the part of some water users, who finally secured an injunction in the State court against closing the headgates of those who refused to pay. The number of these was, however, small—only 170 resisted paying out of more than 3,000 accounts. The legality of the bureau's action was later sustained by the Federal court, and practically all such payments have since been made.

Enforcing collections is an unpleasant duty, but the integrity of reclamation requires it. To close our eyes to the accumulation of arrears is not only a violation of duty, but an injury to water users. It tends to build up a debt they can not overcome, and discredits the whole reclamation policy.

### THE SITUATION OF SETTLERS LOCATED ON WORTHLESS LAND

The relief extended to settlers located on worthless land, under subsection K of the fact finders' act, is to relieve them from paying construction costs. This is not what they need, because providing free water would not enable them to make a living. What these settlers should have is aid in shifting to a farm where they can make a living.

Some of these worthless lands were privately owned when the Government constructed the irrigation systems, but most of them were unentered public lands. On the privately owned land the Government has not the moral obligation to the extent it has on the land it represented as irrigable to the homesteaders, and possibly on privately owned lands should only lose its investment in the irrigation works.

At present these worthless lands are largely abandoned but scattered over them are a certain number of persistent resident owners, still trying to make a living. They are doomed to certain failure. Sooner or later they will have to move on. Some have lived on their farms for 15 years, working for others almost continuously. Existing laws now permit the relinquishment of holdings where the irrigable area has been reduced to less than 20 acres, and the transfer of rights and payments to better lands, if available, within the State. There is, however, very little good public land that may be used for this purpose. Even if other good lands were available in sufficient areas to take care of these unfortunate settlers, they have no money with which to make the new development. These conditions justify consideration for these settlers.

If some measure of relief could be formulated whereby settlers so situated would be assisted to move to other projects, located on good land, and to improve and bring into cultivation a new farm, it would remove one of the most distressing consequences of unwise settlement in the past and greatly reduce operation costs by making it possible to abandon ditches that will have to be kept in use as long as these settlers remain.

## ENGINEERING, AGRICULTURAL, AND ECONOMIC NEEDS

### SALT RIVER PROJECT

(Operated by the Salt River Valley Water Users' Association)

*Engineering and financial.*—No period in the history of this project has been marked by greater progress. The entire \$7,000,000 power development program, for which definite plans were started in 1920, will be completed shortly. The initial unit under the first bond issue of \$1,800,000 was completed when the Mormon Flat Dam was finished in January. A \$500,000 power plant at the dam, financed by the presale of power, will be completed by spring. The Horse Mesa Dam and power plant are under construction and are financed by a \$4,743,000 bond issue. These developments will bring the project power system up to 82,000 horsepower.

*Agricultural and economic.*—This is one of the most successful of the irrigation projects. Farming is diversified, the climate permitting cultivation during the entire year. The major crops are cotton, alfalfa, grain, citrus and deciduous fruits, cantaloupes, grapes, small fruits, and vegetables. The water users are prosperous and progressive.

### YUMA PROJECT

*Engineering.*—The irrigation system planned for this project has been completed. Additional drainage may be needed on the reservation division. The completion of the drainage system on the Yuma Valley division has been provided for. A workable plan is needed for the control of silt and water grass, which now

makes the operation and maintenance of the distribution system difficult and expensive. Experimentation with concrete lateral lining is now in progress.

The cost of maintaining the levees of the Colorado River, to confine it to its course and prevent flooding of adjacent lands, has been a serious financial burden on the water users of this project. Legislation was enacted to relieve them of part of this cost, but appropriations are required to make this effective.

*Agriculture.*—This project has a long growing season. The principal crops are cotton, alfalfa, and alfalfa seed. Lettuce is grown and sold in carload lots. Conditions are particularly favorable to dairying, because of the absence of cold or stormy weather.

*Financial and economic.*—The Yuma project has made a fine record in meeting its obligations to the Government. The total charges assessed for construction and for operation and maintenance for the five-year period, 1920 to 1924, amount to \$2,473,228.46, of which \$2,178,802.75 has been paid and only \$294,425.71 remains uncollected. The payments for this difficult period are a little more than 88 per cent of the amounts assessed. Proximity to the Pacific coast cities insures a favorable market for stock and many of the products produced.

About 49 per cent of the irrigated farms on the project are cultivated by tenants. Many of these tenants have no permanent interest in the conditions needed to make local communities more satisfactory for the wives and families of the resident farm owners.

*Recommendation.*—Efforts to give effect to the law prohibiting ownership of more than a single farm unit by one individual, and to attract farm buyers to this section, are imperative and are being made.

### YUMA MESA PROJECT

*Engineering.*—The Yuma Mesa auxiliary project was authorized by the act of January 25, 1917, as amended February 11, 1918, and embraces about 45,000 acres of land south and southwest of Yuma, Ariz. Lands in the first unit, comprising 6,400 acres, were designated for sale on December 10, 1919, at a minimum price of \$25 per acre and an additional cost of \$200 per acre for construction charges. The chief construction need at present is the early completion of the hydroelectric power plant to provide energy for pumping operations. The construction of this plant has been provided for. Distribution system has been completed for 3,800 acres. Additional canals, laterals, and ditches should be constructed and concrete lined when the lands now served with water are cultivated and additional lands are required for settlers.

*Financial and economic.*—Of the total acreage held in private ownership in the "A" unit, less than 1,000 acres are in cultivation. The cultivated area is planted chiefly to grapefruit, oranges, dates, grapes, and early winter vegetables. The character of the soil and comparatively frost-free conditions make it possible, with good cultural methods, to obtain large yields of excellent quality grapefruit.

*Recommendations.*—Authority is needed to construct ditches or pipe lines to clear, level, and make ready for planting additional

land in "B" unit owned by the Government. This should be followed by an intensive campaign for its sale and development by purchasers amply supplied with funds. The need for adequate capital is manifest when it is realized that the development of a 10-acre grapefruit grove requires the expenditure of approximately \$10,000 in addition to the cost of the land and water right. Syndicate development of these lands has proved very successful and steps are being taken to extend this method of development.

### ORLAND PROJECT

*Engineering.*—The extreme water shortage of 1924 demonstrated that the imperative need of the project is hold-over storage. Studies indicate that the situation can be met most economically by development of 50,200 acre-feet of storage on Stony Creek at the Stony Gorge Reservoir site. A preliminary appropriation of \$50,000 has been made and plans made to perform the work as supplemental construction, agreements for which have been circulated among the water users. Of the 796 ballots issued, 687 were returned. Of these 660 were in favor of the work, 25 against, and 2 ballots were rejected. Of the 25 negative ballots all but two were cast by nonresident landowners, indicating an almost universal sentiment among resident property owners in favor of the proposed reservoir.

*Agriculture.*—This locality has a long growing season and part of it is producing citrus fruits commercially. Other crops grown are alfalfa, small grains, deciduous fruits, nuts, melons, and vegetables.

*Financial and economic.*—Owing to adverse conditions prevailing on the project from drought during 1924, the water users for the first time were unable to meet their charges on the due date. Notwithstanding the depressed condition of agriculture operation and maintenance collections for the five-year period 1920 to 1924 amounted to more than 96 per cent of the total. Ninety per cent of the construction installments have been paid.

*Recommendation.*—Construction of Stony Gorge Reservoir should be rushed.

### GRAND VALLEY PROJECT

*Engineering.*—To complete this project as originally planned would require the construction of a hydroelectric power plant, a number of pumping stations, and a lateral system for some 8,500 acres under pumping and 1,650 acres under gravity extension. No further construction is now contemplated on the irrigation system, but additional drainage will be required when all lands are being irrigated. Construction costs for the land under the gravity system should, therefore, be fixed on a basis of work completed plus the estimated cost of the additional drainage. The construction work on the Orchard Mesa division will be completed during the fiscal year 1926. There remain to be finished the enlargement of the distribution canal, the replacement of two pumping units, and the excavation of tail race and spillway. A small amount of drainage work is necessary.

*Agriculture.*—There are approximately 32,000 acres in the gravity division of which less than 15,000 acres were irrigated in 1924. Good yields of alfalfa, sugar beets, grain, and some of the orchard crops are obtained. The average value of crops for nine years of record amounts to \$45.40 an acre. An early potato has proved profitable. Canneries and a sugar-beet factory serve the project.

*Financial and economic.*—At least 200 settlers are needed to occupy and cultivate the lands now undeveloped or partly farmed. Some coordinated action to fix the price of privately owned land at its productive value and to obtain settlers for these areas is urgently needed. Provision for long-time and intermediate credit is needed for both the new settlers and those now living on the project who are heavily in debt.

The accruals of operation and maintenance for the four years 1921–1924 amounted to \$214,498, of which \$190,706 has been paid, \$19,113 deferred under act of May 9, 1924, and \$1,859 is delinquent. Charges for the operation and maintenance for 1924 have been paid, excepting \$2,820.

If public notice announcing the construction cost for the gravity division is issued during 1925 under the reclamation extension act the amount of payment required might be more than the water users can pay when added to the instalments of the deferred operation and maintenance charges due March 1, 1926, and March 1, 1927, and the operation and maintenance charge for the current year. If, however, issue of public notice is deferred until after December 1, 1926, the water users will have time to form an irrigation district if desired and effect a contract with the United States under the terms and conditions of the act of December 5, 1924 (43 Stat. 101), which provides for the repayment of the construction cost in accordance with 5 per cent of the average gross acre crop returns. While this date for public notice will make the first construction payment due on December 1, 1927, the distribution of charges between March 1 and December 1 will permit the payments to be made from two crop seasons instead of one.

*Recommendations.*—Public notice for the gravity division should be issued under the act of December 5, 1924, after December 1, 1926, and the water users should in the meantime make preparations and progress toward taking over the operation and maintenance of the project. An order should be issued to the water users of the Orchard Mesa division in 1926 that construction work has been completed. The assessments for the first repayment installment due under the contract would follow and the amounts due collected.

### UNCOMPAHGRE PROJECT

*Engineering.*—The irrigation system as planned for this project has been completed. A considerable area is seeped and its productivity is impaired. A portion of these seeped areas is poor land and should be eliminated from the project. The remaining seeped areas need drainage. The extent of these lands and the estimated cost of draining them has not been determined because individuals have elected to carry out their own drainage work. Until recently the water users have shown little interest in a comprehensive drainage plan.

*Agriculture.*—Thus far farming has been confined to the growing of staple farm crops, such as alfalfa, small grains, sugar beets, potatoes, beans, and onions. A small acreage of apples is also in bearing. These crops in some years have had to be marketed at a loss owing to heavy freight and marketing charges. Because of this, crops and products should be produced of relatively high value or concentrated

in form. More and better livestock are needed. Canneries and other industries for the local conversion and preservation of products should be obtained.

*Financial and economic.*—For the period 1922 to 1924 the uncollected construction charge on this project amounts to \$249,523. The unpaid operation and maintenance charges amount to \$130,123. The principal reason for these huge delinquencies is the blanket moratorium. Another reason is the agricultural depression which was particularly acute on the project owing to its isolated location, making marketing especially difficult. In 1922 there was a pronounced shortage of cars for the movement of agricultural products from the project. As a result of the agricultural depression many good farmers left the project. Another reason for the delinquencies may be found in the high mortgage debt per acre, and the high interest rates charged on these debts. Out of 2,098 farms investigated, 338 had been foreclosed or turned over to the mortgagee in satisfaction of the debt. Nine hundred and thirty-nine of the remaining farms were mortgaged for an average of \$67.14 an acre, or for a total sum of \$3,002,278.94. The average annual interest burden per encumbered farm is \$245.92, or \$5.16 an acre. These mortgages should be converted into long-time amortized loans with a lower rate of interest.

The settlers under the East Canal and Selig Canal systems need favorable consideration. Good roads are scarce and long hauls to shipping stations are numerous. There is also a lack of schools and good water for domestic purposes is not available.

*Recommendations.*—There is a large area on this project served with canals and water, which experience has shown is unsuited to irrigation farming, and it should be eliminated from the project.

The project should be rehabilitated by putting into effect a comprehensive plan of settlement in which land prices should be based on their productive value and sold as partially improved farms under suitable repayment terms. A source of suitable long-time and intermediate credit should be found for both new settlers and those now residing on the project. The operation and maintenance charges should be collected in advance.

### BOISE PROJECT

*Engineering.*—On the constructed portion of this project additional drainage is needed for a small area, and distribution systems will be required for the Hillcrest and Black Canyon divisions. For the Hillcrest division, storage capacity has been reserved in the Arrowrock Reservoir. Storage eventually will be needed to supplement the natural flow of the Payette River for the Black Canyon division. The Black Canyon power plant, the power from which will be temporarily leased to the Gem irrigation district, will be used ultimately for pumping water to a part of these lands.

*Agriculture.*—Fruit growing and general farming are both successful on this project. Alfalfa, small grains, potatoes, and corn are the leading crops produced. Dairying is increasing and is one of the most profitable industries.

*Financial and economic.*—The rapid increase in the indebtedness of this project during the last five years, 1920 to 1924, is a cause of serious concern to this bureau. During that period, \$452,875 of

operation assessments remain uncollected, and \$1,222,735 of construction charges are past due and unpaid. Prior to 1917 this project had paid promptly nearly all of its charges. The project experienced a boom during the high war prices, which burdened purchasers of land with excessive contractual debts that can not be repaid under present farming conditions unless the repayment terms of these debts are modified; many farms are mortgaged because of expansions made at that time and taxes generally are high. There was a serious water shortage in 1924. On this project are 1,347 tenants who cultivate 38 per cent of the irrigated farms. These conditions explain in part the local delinquencies but do not account for the default in water charges made by those who are prosperous. This project can and should make a better financial showing. Natural advantages are not lacking, and it has passed the pioneer stage of development. Conditions and production warrant that operation and maintenance charges should be collected without exception.

*Recommendations.*—A contract draft has been prepared for the transfer of this project to the water users under district organizations. The water users will be benefited by receiving the repayment plan of construction cost on a basis of 5 per cent of the average gross annual crop returns instead of the 20-year schedule now in effect and the Government will be benefitted by being relieved from operating and maintaining the distribution system.

Because of high freight rates there is a need for canneries and other industries that will permit shipment of products in concentrated form. More livestock should be on farms. The large holdings on this project should be subdivided and 600 settlers secured to completely farm the project.

### KING HILL PROJECT

*Engineering.*—The King Hill project was begun as a Carey Act enterprise. Canals were built and the land settled as a private project. This failed. The settlers were unable to keep the project works in repair. The State, which took over the project, was equally unable to finance the necessary reconstruction. The Bureau of Reclamation was induced to reconstruct the works at an expenditure, in round numbers, of \$2,000,000, the water users on the project agreeing to reimburse the Government. The reconstruction of the project as planned is completed.

*Financial and economic.*—Of the 263 farms supplied with water for irrigation, 75 are idle. Of the 188 irrigated, 71 are cultivated by tenants.

During the last four years, 1921 to 1924, inclusive, only 48 per cent of operation and maintenance cost has been paid and nothing has been paid on the money advanced for construction. Before the Government took over this project the canal system consisted, to a large extent, of wood flumes and siphons. The deterioration of these and canal breaks caused excessive water delivery losses for several years. This shortage of water greatly reduced crop yields, which, together with the subsequent fall in the prices of agricultural products, burdened these settlers with private debts. The project has a relatively long canal and lateral system for the acreage served, which



causes a high operation and maintenance cost per acre. These conditions explain the poor financial showing made by this project.

*Recommendations.*—Contract for the operation and maintenance of the project expires December 31, 1925. It should not be renewed.

The shallow soil, unsuited to permanent agriculture, should be eliminated from the project. This would leave an ample water supply for the remaining area.

An improvement in the financial and economic conditions would be brought about by the subdivision of large land holdings and the settlement of these areas by skilled cultivators. Better cultivation should be practiced and more good livestock should be kept on farms. About 75 experienced farmers are needed.

The present mortgages and private debts require adjustment so they can be paid from the profits of farming.

### MINIDOKA PROJECT

*Engineering.*—Settlers complain that the pumping and canal capacities for the south side pumping division are inadequate during the peak of the irrigation season. More electric power is needed for pumping and for use on the project. This can be secured from the development at American Falls or from the construction of another power unit at Minidoka Dam, where at present the full regulating capacity of Lake Walcott is not utilized because at the peak of the irrigation season water in it must be maintained at maximum level to produce the greatest amount of power from the present plant.

The American Falls Reservoir, now under construction, has been financed jointly by the United States, to provide storage and power for the proposed north side pumping division of the Minidoka project, and by various canal companies and irrigation districts requiring additional water to supplement their direct diversions from the Snake River. These companies and districts have paid in cash \$2,543,966.42. The dam will be built to impound 1,700,000 or 1,045,000 acre-feet of water, depending on the amount of advance payments which shall be made by those who have contracted with the United States for water, or upon other arrangements that may be made to finance the cost of the larger storage. The foundation is being provided for the higher dam, but the contractor must soon be notified as to the height of the dam to be built. The larger capacity will ultimately be used to provide for the future development of Snake River Valley.

*Agriculture.*—The soils of this project are generally deep and fertile. Small grains, potatoes, sugar beets, and alfalfa are successfully grown and produce good yields. The inland location of the project and consequent high freight rates favor the consumption of bulky crops by livestock on the farm. Five cheese factories and two creameries on the project stimulate dairying. Two sugar factories offer a good market to beet growers.

*Financial and economic.*—The accumulated amounts owing the United States for the period 1920 to 1924 on construction charges are \$585,914, and on operation and maintenance assessments are \$233,177. This large increase in indebtedness in so brief a period of time is serious. It can not be explained through lack of natural

advantages. Few projects equal this one in having a combination of fertile soil, a climate favorable to plant growth, low construction costs, and operating expenses. Much of it is no doubt due to the heavy private indebtedness of water users and the pressure exerted upon them by their creditors. Land values were inflated when the prices of farm products were high. Settlers paid small amounts on the purchase price and are trying to pay the balance due on their contracts out of greatly diminished incomes, with the result often that water charges are not paid. Another reason for the bad financial showing is the high percentage of tenancy. Forty-four per cent of the irrigated farms, or 1,010, are cultivated by tenants. Nearly all the banks on this project failed and wiped out the savings of many settlers. In cases where the water users could pay and have not done so it is because their neighbors were not paying and they believed the delinquencies would be funded with the construction account.

*Recommendations.*—The American Falls Reservoir should be financed for the larger capacity which will be needed for the full development of the Snake River Valley. Water will be provided by this reservoir to supply 125,000 acres of land in the north side pumping division, which should be constructed when the demand for land by settlers increases. More power should be provided and the pumping and distribution system should be enlarged on the south side pumping division. Additional drainage is essential to maintain high productivity on some areas. More farm owners, more livestock, and better improvements and equipment of farms are needed. The mortgages should be refunded as long-term amortized loans with lower rates of interest.

### HUNTLEY PROJECT

*Engineering.*—The irrigation system as planned for this project has been completed, but some betterment work is being gradually accomplished and paid for as a part of operation and maintenance expenses. Scattered areas, totaling about 1,200 acres, are badly in need of drainage, but of this 700 acres are of such poor quality that expenditure for drainage is not advisable.

*Agriculture.*—The Huntley project was originally settled in small farm units and as a result is one of the best farmed and best-improved projects of the Rocky Mountain region. Much of the land is being intensively cultivated, with a large acreage in sugar beets which produce excellent returns both in tonnage and sugar content.

*Financial and economic.*—During the 5-year period, 1920 to 1924, about 63 per cent of the payments due on construction, and 62 per cent of payments due on operation and maintenance, have been met. Mortgage foreclosures have caused some of the earlier settlers to lose their farms. This has increased tenancy, and the holding of land in excess of the legal farm unit. Of the 557 irrigated farms on this project, 342, or 61 per cent, are cultivated by tenants. This high percentage of tenancy is both a social and economic disadvantage.

*Recommendations.*—There are about 5,600 acres of land on this project on which the soil is heavy and contains large quantities of alkali. The lands are unproductive and the reclamation of them has proved to be unprofitable.

These lands should be eliminated from the project and the operation of the canals serving them discontinued. This will save operation and maintenance expenses and prevent future losses by settlers who might purchase these lands. The resident settlers should be removed to more productive lands.

### MILK RIVER PROJECT

*Engineering.*—Canals and laterals have been completed for the irrigation of 75,000 acres in the Malta and Glasgow divisions. When completely irrigated, some minor lateral extensions and drainage will be required. The water supply from the Milk River, which is an international stream, is supplemented by storage and diversion of the waters of the St. Mary's River. The completion of the additional pipe lines now under construction on this diversion canal will nearly double the available supply. A small regulating reservoir is needed on the Milk River near the land on account of the great distance the St. Mary's supply must be carried before reaching the project.

Nelson Reservoir, an inland site, supplied with water through the Dodson South Canal, provides an ample supply for the lands below this reservoir including those under the Vandalia Canal.

Supplemental water is also furnished under Warren Act contracts, to lands under old private canals in the Chinook division.

*Agriculture.*—Good land is cheap and water is available for the present needs on this project, but still a large part of the area is either not cultivated or is only producing native grasses. Good yields of alfalfa and alfalfa seeds, small grains, and hardy vegetables are obtained when properly cared for.

*Financial and economic.*—Although the Milk River project has been supplying water to irrigators for 14 years, the construction costs have never been fixed or any payments been made on that account. Water users on this project are being furnished water on a rental basis, which causes a large deficit annually. The cost of operating this project during the period 1920 to 1924 amounted to \$370,528 and only \$95,218 has been collected.

The slow agricultural development and small payments from settlers under this project have been matters of concern for the bureau for a number of years. As a basis for improvement, Congress in 1923 provided for a contract between the department and water users authorizing a reduction in payments and an extension of time for completing payments. This has not been approved by the Secretary of the Interior because there are no provisions to insure bringing about closer settlement and better farming. Without these, payments under any contract are not probable.

About 50,000 acres of the Malta and Glasgow divisions are unirrigated, 42,000 acres being dry farmed and producing crops valued at less than \$6 an acre. Out of 171 farms under irrigated cultivation on these divisions 92 are farmed by owners and 79 by tenants, or 46 per cent of tenancy. A considerable portion of the land is held in large tracts. Large areas are devoted to wild and tame grasses. Few of the present settlers have had experience in intensive farming.

*Recommendations.*—The difference between the cost of operating the Vandalia Canal and the revenue collected creates a condition

that should be ended. The settlers under this canal use scarcely any water. Unless water users will pay the field cost of operating this canal in advance or operate the canal themselves, operation of it in 1926 should be suspended.

The project needs from 100 to 200 carefully selected settlers and some means by which the tenants who are good farmers may be aided in becoming farm owners. A demonstration of the methods of intense culture with its more satisfactory financial returns is badly needed. Means should be provided to place new settlers in a compact area so that thorough cultivation would be the rule and bring about a change in the agriculture of this region. This would result in a larger and quicker return to the United States on its investment in the irrigation system.

### SUN RIVER PROJECT

*Engineering.*—The canal and lateral systems for lands in the Fort Shaw division have been completed. Some drainage is needed. The water supply is ample.

Irrigation works and partial drainage have been provided for about 43,000 of the 100,000 acres in the Greenfields division.

Storage to supplement the normal flow of the Sun River, which is exhausted generally by July 15, is required. The construction of the Beaver Creek Reservoir, for which an appropriation of \$500,000 was made with certain conditions attached by the last Congress, is proposed. Classification of the land in this division is in progress.

*Agriculture.*—The project is well suited to livestock growing and dairying. Alfalfa, grain, and native hay are the leading crops. Experiments with sugar beets indicate that this crop may be added to those mentioned.

*Financial and economic.*—The Greenfields division of the Sun River project comprises all of the land on the north side of Sun River embraced in the original plan for this project. About 43,000 acres are now under constructed canals and 57,000 additional acres in this division and in the Mill Coulee and Sun River Slope divisions can be irrigated from the same main canal system, if additional water is provided. To provide an adequate water supply for the present irrigated area and permit its extension to the 57,000 acres, the construction of the Beaver Creek Reservoir was recommended and an initial appropriation of \$500,000 for its construction was made by the last Congress. This appropriation has attached to it the following condition:

*Provided,* That no part of the sum hereby appropriated shall be expended for the construction of new canals or for the extension of the present canal system for the irrigation of lands outside of the forty thousand acres for the irrigation of which a canal system is now provided, until a contract or contracts shall have been executed between the United States and the State of Montana, whereby the State shall assume the duty and responsibility of promoting the development and settlement of the project after completion, securing, selecting, and financing of settlers to enable the purchase of the required livestock, equipment and supplies, and the improvement of the lands to render them habitable and productive. The State shall provide the funds necessary for this purpose and shall conduct operations in a manner satisfactory to the Secretary of the Interior.

No part of the construction cost of the Greenfields division has been paid, and there has been a continued loss in operation. These conditions will change if more farmers and better farming are secured for the existing area. Grain growing by dry farming methods has

been too generally practiced. During the period 1920 to 1924, the operation and maintenance assessments on the Fort Shaw division amounted to \$71,221 and \$44,668 has been collected. On account of construction \$58,376 has been assessed and \$34,689 paid.

Although past experience has been discouraging, recent developments give hope of better results in the future. An encouraging beginning has been made in the improvement of farm practice. Small areas have been planted to sugar beets. Settlers are buying small flocks of sheep. The tendency to depend on rain and avoid irrigation is being slowly overcome. Some interest is being shown in the settlement of unoccupied or excess land holdings. These changes are hopeful, but are taking place too slowly to make of this a paying project in a reasonable time.

If the reservoir were built for the area now provided with distribution system only, settlers could not pay the cost of the storage. The reservoir can be made a financial success only by bringing additional lands under irrigation. Aid in settlement and farm development of this large additional area must be provided if this great outlay is to be repaid.

*Recommendations.*—Large areas, aggregating in many instances 300 acres or more, should be subdivided and sold to purchasers under a plan where attention would be given to the following: Land prices should be based on the production value of the land; terms of purchase should be long and interest rates moderate and a portion of many of these farms should be sown to alfalfa before the land is sold. This will appeal to skilled settlers of small means. About 250 settlers should be secured for the land now provided with a distribution system.

### LOWER YELLOWSTONE PROJECT

*Engineering.*—The irrigation system of the Lower Yellowstone project is completed with the exception of a few minor structures. Drainage is needed and at least \$400,000 will have to be spent to provide it. One-half will be needed in the near future.

*Agriculture.*—This project has the natural advantages of good soil, abundant water supply, low elevation, and favorable climate, and is traversed by branches of two transcontinental railroads. Yields of sugar beets and other high-priced crops are large. Notwithstanding this, it is an economic and financial failure.

*Financial and economic.*—Water has been available since 1909, but settlers have been slow to use it. Only 14,025 acres were irrigated in 1924, which is less than in 1919 and is less than one-fourth of the total area of the project. Something must be done to increase the use of water for irrigation and make the revenue of the project sufficient to pay the cost of operating it.

The assessments for operation and maintenance have not been collected. Uncollected charges for five years, 1920 to 1924, amount to the huge total of \$238,528, only \$16,381 having been paid. Construction charges were assessed only recently, yet out of \$60,725 due, \$51,194 are unpaid. If irrigation were unprofitable on this project, there might be some excuse for this, but the average crop value in 1924 was \$39 an acre and the returns from sugar beets and other intensively cultivated crops compare favorably with many of

the older projects in the Rocky Mountain States. The project is drifting toward insolvency because land owners do not irrigate.

The high percentage of tenancy is a drawback. Out of 390 irrigated farms 155 are cultivated by tenants. The subdivision of large holdings into small irrigated farms, and the settlement of these must in some way be brought about. Local people wait for the Government to make additional concessions which, it is claimed, will stimulate settlement. It will not have this result unless they recognize more definitely than they do now their responsibility for the repayment of their debt to the Government. Aside from deferment of their delinquencies, farmers on this project will gain nothing by a change in the form of payment. As it is now, they are required to pay only 2 per cent on the cost of construction (\$45 an acre) which amounts to a yearly payment of 90 cents an acre. This is less than 5 per cent of what the average crop return will be when the land is properly farmed.

*Recommendations.*—Operating this project at Government expense should cease. Charges for this should be collected in advance. Large expenditures for drainage should not be made until more farmers and better cultivation are assured. Delinquent excess holdings or unoccupied farms should be acquired by some authority and when acquired should be subdivided and sold to qualified settlers on long terms with a low rate of interest. The improving of these farms and the settlement of them should be entrusted to an officer skilled in this work. He should also assist others not delinquent to dispose of their unoccupied farms or excess holdings.

#### NORTH PLATTE PROJECT

*Engineering.*—Irrigation works for the north side lands are completed. Those on the south side lands will soon be completed. Drainage for south side lands is being provided as needed; for north side lands, available funds are exhausted and numerous small areas still remain which can not be utilized without drainage. In general, however, their reclamation will not be warranted by reason of high per acre cost. The Guernsey Reservoir, which will supplement the water supply by additional storage capacity and closer river regulation and provide additional power to the project, is under construction.

*Agriculture.*—The soils of this project are productive excepting a considerable area of light sandy land on the north side and areas of heavy gumbo land on the south side. The main crops are alfalfa, small grains, sugar beets, and corn. There are four sugar-beet factories on the project.

*Financial and economic.*—Arrears of payment are so large on this project, exclusive of the Fort Laramie division on the south side, as to be a menace to its solvency. The amounts owing for operation and maintenance assessments for 1920 to 1924 are \$594,189 and for construction charges for the same period \$1,262,333, or a total of \$1,856,522, which is the largest of any project. This is due partly to the struggles of the water users to pay off their private debts, which have grown out of land purchases at speculative prices, expansion of operations during prosperous times and borrowings to improve and equip farms. Many farmers lost their units through mortgage foreclosures. Sixty-one per cent of the farms on this

project are farmed by tenants. Tenancy should be checked by land-owners selling their lands at moderate prices on reasonable terms and surrounding the undertaking by the use of long time and intermediate credit suited to the needs of experienced settlers with small capital. This will be hastened if the Government insists on the payment of its charges. Relief and the funding of accrued delinquencies into the construction charge are too often capitalized by speculators, resulting in no benefit to the actual settler who purchases the land.

*Recommendations.*—Operation and maintenance charges should be paid each year by all individual farmers who receive water. Mortgages should be refunded on terms and conditions that farmers can pay. A coordinated plan should be put into effect to sell the surplus holdings, the unoccupied farms or those farmed by tenants to bona fide settlers.

### NEWLANDS PROJECT

*Engineering.*—The Newlands project obtains its water supply from the Truckee and Carson Rivers. A reservoir has been built on the Carson River to store water from that river and flood water carried from the Truckee by means of the Truckee Canal, for irrigation of lands in the Carson Valley. In the original plans of the project Lake Tahoe was to serve as the regulator for the Truckee lands. This plan has been interfered with by vested rights and power developments which restrict the amount of water which can be stored in the nonirrigating season. Both the Truckee and Carson Rivers are interstate streams and the conflict of irrigation and power rights has led to continuous water-right litigation since the inception of this project. The lands in the Carson division have an ample water supply. Lands in the Truckee division, of which about 5,000 acres are in cultivation, have an inadequate supply some years. The water rights on the Truckee River are being adjudicated and it is hoped that the final decree will improve this situation. These lands can secure supplemental water from the proposed Spanish Springs Reservoir if constructed. A soil survey and land classification now being made will show the land that should be irrigated under the original scheme. This will enable the amount of surplus water available for the Spanish Springs division to be determined.

*Agriculture.*—The principal crop grown is alfalfa. There are unusually favorable opportunities on this project for stock raising and dairying. Dairying is on the increase. A sugar factory was erected on the project, but is idle because not enough farmers are willing to grow beets to make it a success.

*Financial and economic.*—The irregular surface of much of this project required a large expenditure to prepare the land for irrigation. Many of the original settlers did not have money to do this and the development of their farms was consequently delayed. In other cases settlers gave up because they were unable to continue. Alkali developed soon after water was turned on and farm incomes were reduced. Notwithstanding these drawbacks the settlers have paid in the period, 1920 to 1924, 78 per cent of their construction and 79 per cent of their operation and maintenance assessments.

*Recommendations.*—The irrigable area of this project should be accurately determined in order that the water of both the Truckee

and Carson Rivers may be fully utilized on the most productive areas served by them.

Many large land holdings under old vested water rights should be subdivided and disposed of to settlers.

Quarantine regulations against the alfalfa weevil prevent the shipment of alfalfa hay into or through California to market. This causes low returns for hay except when fed to stock on the project. More credit suited to the needs of livestock and dairy farming is required to increase these industries. Better freight rates for feeding livestock in transit should be secured. Farmers should be induced to improve their farm facilities for feeding and caring for livestock. Better facilities should be provided for weeding out unprofitable dairy cows, and an intensive campaign for improving the dairy herds should be started.

### CARLSBAD PROJECT

*Engineering.*—The reduced capacity of the McMillan Reservoir due to silt conditions and excessive losses by leakage requires the construction of additional storage. Investigations are in progress to determine the most feasible location for another reservoir. It may also be found necessary to line some of the canals to reduce losses in distribution. This would lessen the requirements for storage and drainage which is needed on scattered tracts throughout the project.

*Agriculture.*—The climatic and soil conditions of this project permit a wide range of crop production. The two leading crops are cotton and alfalfa. Hardy fruits do well.

*Financial and economic.*—An excellent record in repayments has been made by the Carlsbad project. Charges on construction and operation and maintenance assessed during the 5-year period, 1920 to 1924, amounted to \$554,477.26, of which \$529,369.84 was paid, leaving unpaid only \$25,107.42. The remoteness of this project from large markets makes it necessary to have cooperative arrangements for shipping and marketing crops and products. At present cotton is the most profitable crop. To maintain the fertility of the soil and obtain satisfactory yields, a large area of land must be kept in alfalfa. To cultivate the land of this project in such a way as to secure the best results, at least 200 additional settlers are needed.

*Recommendations.*—Additional water storage capacity should be provided to replace the depleted storage in the McMillan Reservoir.

The large holdings should be subdivided and more farms cultivated by owners.

### RIO GRANDE PROJECT

*Engineering.*—The main features of the irrigation and drainage systems as planned for the Rio Grande project have been completed. One of the problems which confront the water users and land owners on the project, particularly in the district below El Paso, is that of flood protection.

The Rio Grande, which is used as the main carriage canal from Elephant Butte storage dam throughout the project, has, owing to the absence of large destructive floods, elevated its channel in the El Paso Valley where it is the international boundary line, and the valley lands and irrigation and drainage works are menaced annually by flood discharge from the drainage area below the storage dam. Complete rectification and control will undoubtedly require a treaty



between the two countries. In the mean time, the city and county governments of El Paso are providing limited protection measures, and most likely additional project funds will be required to effect reasonable protection to project works and lands, pending negotiation and solution of the international problem.

*Agriculture.*—The abounding prosperity of the Rio Grande project in recent years has been due largely to the production of cotton. Alfalfa is next to cotton in acreage. Melons, pears, grapes, small fruits, and vegetables are extensively grown for local and eastern markets.

*Financial and economic.*—All charges on this project have been promptly paid. The water users' financial relations with the Government have been businesslike and highly satisfactory.

The settlers on this project are well organized and this fact has permitted teamwork in solving their problems and has enabled them to market their products to better advantage.

*Recommendations.*—As a general rule, tenancy flourishes with cotton growing and this project is no exception to this. Twenty-five per cent of the farms on this project are occupied by tenants. The water users and civic organizations have been active in securing settlers. This work should continue until the farms are occupied by resident owners.

#### UMATILLA PROJECT

*Engineering.*—The Eastern division requires additional lateral lining to prevent excessive seepage losses. Other improvements to the distribution system are needed to facilitate the delivery of water. The cost of this work must be charged to construction because it is too expensive to be carried on as operation and maintenance.

*Agriculture.*—The project has to a large extent been devoted to alfalfa production, much of which has been shipped out baled or as alfalfa meal. More livestock should be kept on farms to consume the alfalfa produced and generally to build up the soil, which is extremely sandy.

*Financial and economic.*—The Government has advanced \$590,359 for operation and maintenance, of which \$314,621 has been repaid and \$190,628 funded with the construction account leaving \$85,110 which is unpaid. The amount due and unpaid on the construction charges is \$177,546. An area in excess of 4,000 acres is so sandy as to make irrigation farming on it unprofitable. Less than 10 per cent of this area was cultivated during the past irrigation season.

*Recommendations.*—Approximately 4,000 acres of poor land should be eliminated from the project to avoid operating long laterals for unproductive areas. It will also save water by preventing its unproductive use, and put an end to the trafficking and speculating in these lands.

#### KLAMATH PROJECT

*Engineering.*—The irrigation and drainage works necessary for the lands in the main division have been completed, and of the unwatered area in the bed of Tule Lake irrigation and drainage works have been provided for 8,000 acres. Several tracts above the main canal which can be irrigated by low pumping lifts have been organized into irrigation districts and are constructing their own

pumping and distribution systems. Water for these lands is furnished from the project supply. Power is available at a low cost.

Storage for irrigation of the lands in the Langell Valley has been provided in the Clear Lake and Gerber Reservoirs. These reservoirs also retain the flood waters of Lost River which has resulted in drying up Tule Lake and making the large area in the bed of this lake available for farming.

Canals and laterals for the irrigation of the lands in the Langell Valley are being constructed under irrigation district contracts.

A large part of the land unwatered in the bed of Tule Lake still requires distribution and drainage works. These should be provided as soon as the demand is sufficient.

The water supply is ample for all lands in the project.

The lands in Lower Klamath Lake have been unwatered and the part of the bed of this old lake located in Oregon is being developed by the Klamath drainage district. The disposition of the 30,000 acres of this lake bed in California is a problem which awaits action. There is danger of the dry peat land catching fire. If reflooded this danger would be removed, but this is opposed by the Klamath drainage district. A board of experts is to make a study of the problem, report whether the land is suitable for cultivation, and recommend what should be done with it.

*Agriculture.*—Satisfactory yields of alfalfa, tame and wild irrigated pastures and small grains, adjacent forest reserves for summer pastures, plentiful stock water, freedom from livestock diseases, and cheap lumber for barns and stock sheds make this project unusually suited to stock and dairy farming. The growing season is short but the days of summer are long and warm and growth is rapid.

*Financial and economic.*—The Klamath project has made a fine financial showing in the payment of its debt to the United States. Eighty-eight per cent of operation and maintenance and nearly 99 per cent of accrued construction assessments have been paid. However, this condition was largely brought about by a credit to the district of \$30,000 on account of an adjustment of the matter of carrying water to the Van Brimmer ditch and the yearly additions made to the assessment rolls amounting to 10 per cent to cover probable delinquencies. The fact is that a considerable number of water users are delinquent to the district for their irrigation taxes. Four large holdings comprising 1,370 acres are delinquent in their State, county, and irrigation taxes, including penalties, for a total of \$28,884. If this sum and other delinquencies of lesser amounts were collected and the portion of these representing irrigation taxes turned over to the district it would be in a very solvent condition. The enforcing of the district's tax liens in such cases will accomplish this result.

*Recommendations.*—Plans for the settlement of 8,000 acres of the Tule Lake division have been deferred owing to a protest by the water users on the settled part of it over the construction charge. It has been fixed at \$90 an acre, which is the amount needed to repay construction costs based on present allocation of costs to the 24,200 acres in this division. It is proposed to open to settlement 8,000 acres for which construction has been completed. Further construction on this area is to be suspended until the land is occupied and the construction cost controversy is decided.

## BELLE FOURCHE PROJECT

**Engineering.**—The project needs drainage. To provide this will cost not less than \$1,000,000. This expenditure should await measures for agricultural development and settlement.

**Agriculture.**—The soil of the project is very productive of temperate zone crops and it has an ample water supply; the construction and operation charges are low.

**Financial and economic.**—From its inception to the present the Belle Fourche project has been operated largely at public expense. The total expenditures for operation and maintenance have been \$1,109,625 and the total repayments \$492,719. In the 17 years of operation the project has cost the Government \$616,906. The construction cost amounts to \$3,547,570, of which but \$472,025 has been returned.

Only 31 per cent of this project is farmed by resident owners; the remaining lands are either farmed by tenants or are abandoned. Adjacent to the town of Newell, S. Dak., there now are 76 abandoned farms. There are 10 more occupied by tenants. The indebtedness of 39 of these farms was analyzed. Not only are the Government water charges delinquent but the State and county taxes are unpaid. The tax indebtedness will soon be more than the land is worth. The following table shows the State, county, and irrigation taxes that have accumulated on the 39 farms in the last 6 years.

Tax accumulation on specified farms

Tract No.	Acreage		General taxes							Irrigation district assessments			Total	Grand total
	To-tal	Irrigable	1919	1920	1921	1922	1923	1924	Total	1923	1924	1925		
1	160	69				\$74.09	\$161.10	\$148.97	\$384.16	\$4.83	\$146.73	\$146.73	\$298.29	\$682.46
2	160	76				159.44	33.22	180.85	373.51	98.67	328.47	286.42	713.56	1,067.07
5	80	63	\$201.39	\$127.02		162.05	161.10	148.07	799.63	171.48	300.03	226.98	698.49	1,498.12
6	80	78						151.78	151.78	266.70	422.70	404.70	1,094.10	1,245.88
9	40	40						77.42	77.42		28.07	83.87	111.94	189.36
10	40	40						74.32	74.32		27.60	82.80	110.40	184.72
11	80	70			137.66	180.40	194.04	161.65	673.75	13.60	114.80	174.60	303.00	976.75
14	80	60	147.90	125.69	125.36	139.51	128.91	128.91	667.41	205.12	389.22	311.32	856.66	1,523.07
15	80	64		128.51	135.09	147.81	137.50	137.50	548.91	178.84	306.84	233.24	718.92	1,267.83
16	80	80		146.51	148.18	177.71	163.84	163.84	636.24	220.57	406.70	302.07	928.81	1,565.05
17	80	62								173.22	299.52	227.92	700.66	700.66
19	80	70		154.01	137.52	165.06		144.93	601.51	187.96	330.56	313.86	832.38	1,433.89
20	80	57						124.82	124.82	153.10	267.10	203.50	623.70	748.52
21	80	74						165.95	164.50	92.43	288.03	264.63	645.09	975.54
23	80	80						166.08	154.84	320.92	114.25	345.00	311.75	771.00
25	80	79		158.07	166.92	171.06	203.88	203.88	699.93	222.28	402.98	302.78	928.04	1,267.97
26	80	63						122.05	122.05	207.86	333.86	261.36	803.08	925.13
28	80	71									333.69	251.99	585.68	585.68
29	80	50		115.97	121.64	112.26	139.51	127.92	617.30	135.65	235.65	178.15	549.45	1,165.76
30	80	74						83.92	83.92	241.31	389.34	304.24	934.92	1,018.84
31	80	65						70.01	70.01		87.17	171.27	172.14	242.15
32	160	33			113.38	127.30	127.88	117.84	486.40	89.93	155.93	148.28	394.14	880.54
33	80	49						106.41	106.41		170.41	114.01	284.42	390.83
34	80	65		126.44	130.00	116.00	128.71	131.39	632.54	213.80	343.80	268.95	826.55	1,459.09
35	120	73						147.08	147.08	240.01	386.01	369.31	995.33	1,142.41
37	80	44		98.56	108.00	99.54	117.92	108.39	532.41	4.36	105.56	146.06	255.98	788.39
38	80	15	\$21.93	58.82	53.53	52.39	58.13	54.21	299.01	2.91	26.51	33.96	63.38	362.39
39	80	75						83.34	83.34		185.65	254.65	440.30	523.64
40	80	76		152.01	148.46	143.69	175.18	147.36	766.70	259.82	411.82	323.27	994.91	1,761.61
41	160	128		204.55	254.70	247.75	284.83	265.17	1,257.00	360.80	623.83	526.28	1,510.99	2,767.99
42	40	37						36.40	36.40		106.78	165.88	272.66	309.06
43	80	72						99.08	99.08		71.36	315.61	386.97	486.05
44	80	61	85.64	120.70	157.81	119.56	139.92	130.60	754.23	207.79	847.94	268.79	824.52	1,578.75
45	160	93						271.00	271.00	144.01	434.61	428.61	1,007.23	1,278.23
46	40	39						34.40	34.40		88.52	93.02	181.54	215.94
147	160	134	141.34	189.21	269.50	269.42	316.36	280.61	1,546.74	443.36	680.56	611.16	1,735.08	3,281.82
48	80	72						71.70	71.70	.66	1.32	50.82	52.80	124.50
49	80	34						62.72	62.72		75.60	81.10	156.70	219.42
50	80	71					171.06	202.65	373.71	191.69	336.29	317.29	845.27	1,218.98
		2,556							14,918.91				24,608.06	39,526.99

1 1918, \$80.30.

The maximum tax delinquency amounts to \$26 per irrigable acre and the average is \$15.47 an acre. Tax certificates have been offered by the county with no buyers. There is nothing in this situation that justifies spending \$1,000,000 for drainage. Unless more and better farmers can be secured, the operation of this project in the future will be as unprofitable as in the past.

*Recommendations.*—Two courses are open to the Government. One is to dispose of the project, as has been done at Williston. The other is to enter into a constructive program of agricultural development and settlement to save the Government's investment and make it a solvent undertaking. The latter course is advocated for the following reasons: Such important economic factors as ample water supply at low cost, good soil, and favorable climate should make it a successful project. What is required are more good resident owners who will till their own farms, keep livestock, and grow sugar beets and other crops of high acreage value. This can be accomplished by the Government instituting suits to collect arrears and buying the land if owners do not pay; then disposing of the farms to actual cultivators under terms and conditions that settlers can meet.

### STRAWBERRY VALLEY PROJECT

*Engineering.*—The irrigation works are completed, but some drainage is needed to prevent loss threatened by rising ground water. The water supply is ample and there have been no shortages.

*Agriculture.*—The agriculture of the project is diversified as it has a wide range of crops and is served with beet sugar factories, canneries, and other industries. High-priced crops, especially vegetables for canning purposes, are being more extensively grown each year.

*Financial and economic.*—The record of payments for water is unsatisfactory. During the five-year period, 1920 to 1924, of the \$591,162 construction charges assessed, over 35 per cent is unpaid, and of the \$260,275 operation and maintenance assessments, \$52,735 is delinquent. Nearly all the settlers could meet their charges. The persistent delinquents are hoping to have their arrears covered into construction. The land is well cultivated; 47,560 acres were irrigated out of 53,890 acres for which water was available in 1924.

*Recommendations.*—An organization to assume operation and maintenance of the reservoir tunnel, and power plant is under consideration. A contract is being prepared to accomplish this. Prices and yields of products in 1924 were good and promise to be still better in 1925, which leads to the belief that the water users on this project will cooperate and help carry into effect plans now being made for the complete payment of all project assessments in 1925.

### OKANOGAN PROJECT

*Engineering.*—For several years the project has been extremely short of water. The project water supply has been supplemented by pumping from wells, small ponds in the vicinity, and also from the substorage in Salmon Lake Reservoir. Water is also being rented or purchased by the water users from vested right owners at high prices. They have exhausted all simple means of providing additional water, expending in 1924 as much as \$30 an acre foot in addition to the cost of the Government water, which alone amounted

to \$11.30 an acre. The prospects for providing such added water supply are not promising, although all possible sources are being investigated.

‡ *Agriculture.*—This is an apple growing district. With ample water and good cultural methods from 500 to 1,000 boxes of marketable apples per acre have been produced. Because of the excellent quality of the fruit, which is marketed in the Eastern States, the prices obtained are high.

*Financial and economic.*—There has been expended for operation and maintenance \$409,000, of which \$271,000 has been repaid, \$10,000 funded with construction, and \$49,000 is due and unpaid. The remainder is current charges not yet due. There are \$17,000 of due construction charges which are unpaid. The fixed charges are among the highest of the projects but are not a serious burden when good crops are obtained, which is largely dependent on an ample supply of water.

*Recommendations.*—Investigations of every available source of supply should be continued to supplement the water supply of this project.

#### YAKIMA PROJECT

*Engineering.*—This project is completed as planned for the Tieton and Sunnyside divisions. Some excess storage is available for new divisions, of which there are four.

*Agriculture.*—The soil and favoring climate make this one of the most productive projects in the United States. Large yields of alfalfa, small grains, fruits, and vegetables are obtained. The Tieton and Sunnyside divisions are noted chiefly for their excellent orchards. The average crop value on the Sunnyside division in 1924 was \$63 an acre; on the Tieton division it was \$130. It is expected that these returns will be exceeded in 1925.

*Financial and economic.*—The Yakima project is a solvent enterprise, and conditions of development are such as to enable prompt payment of charges. More than 85 per cent of the charges due, during the five-year period 1920 to 1924, have been paid. Foreclosures by loan agencies and purchases by nonresidents have resulted in considerable tenancy. Out of 4,691 farms, 1,554 are cultivated by tenants. Farms so cultivated are not, as a rule, maintained like those cultivated by owners; attention is not given to soil fertility and crop returns are diminished.

*Recommendations.*—An effort should be made to convert some of these tenants into farm owners, and additional settlers should be secured. This can best be accomplished by selling these lands on their productive value and giving to the purchasers long-term payments. The railroads, civic organizations, landowners and the bureau should cooperate in this.

#### RIVERTON PROJECT

*Engineering.*—The Riverton project has been planned to irrigate 100,000 acres. The main canal and laterals to supply water to 15,000 acres, of which about one-third is public land, will be completed for the larger part of this area by the spring of 1926. A power plant and 28-mile transmission line supply power for construction and project uses. The Pilot Butte Reservoir, providing 30,000 acre-feet

storage capacity, is nearing completion. Further construction will be postponed until such part of this 15,000 acres has been settled and brought under cultivation as will give assurance that when water is provided for additional land it will be in demand.

*Agriculture.*—As this project is located in an undeveloped region, some experimentation with crops to test those best suited to the soil and climate may be necessary. State agencies will be asked to assist in this. Near the town of Riverton alfalfa, sugar beets, grain, and potatoes are grown successfully under irrigation.

*Financial and economic.*—The settlers on the first unit will be remote from railways and markets and will have to pay special attention to products that will stand shipment long distances, such as butter, cheese, eggs, livestock, and honey. They will need cooperative and social organizations. It is planned therefore to concentrate on the agricultural development of this project during the next 12 months.

*Recommendations.*—Water will be offered to the owners of private lands and settlers on public land on liberal terms, under a three-year rental contract, with no charges for construction, and with a probability that water rentals will not meet operating expenses. Settlers on the public land will be selected under the provisions of subsection C of the act of December 5, 1924. Everything will be done to give these new settlers the benefit of local information and practical experience in the improvement of their farms and in working out a crop program. The State authorities, especially the extension department of the State university, will be asked to cooperate and assist in this.

### SHOSHONE PROJECT

*Engineering.*—The Shoshone project includes five divisions. Only two, Garland and Frannie, have been completed and settled. Storage capacity for the other three has been provided and on one of these, the Willwood division, the distribution system has been constructed, but none of the land is settled. Additional drainage is needed on the Garland and Frannie divisions. Drainage will also be needed on the Willwood division, when it is irrigated.

*Agriculture.*—The principal crops of the project are alfalfa, sugar beets, potatoes, and small grains.

*Financial and economic.*—The financial situation on this project is serious. Only 43 per cent of the operation and maintenance charges for the five-year period, 1920 to 1924, have been paid and the arrears now amount to \$205,248. Only 32 per cent of the construction charges for the same period have been paid, the uncollected portion amounting to \$335,232. The early settlers lacked capital to improve and equip their farms and payment of private debts has interfered with payments to the Government. The rapid rise in delinquencies in the past five years shows that unless this is checked and yearly payment of operating expenses is secured, the project will become so burdened with arrears that recovery will be impossible. The agricultural results on the Garland division of this project have been satisfactory, the average crop return being about \$21 an acre, which will increase with the better preparation of land and more thorough cultivation, but on the Frannie division serious seepage

developed, and it is found that much of the soil is unfit for irrigated culture, and more than half of the farms have been abandoned. On both divisions farming operations have been interfered with by the rapid rise of ground water and the prevalence of alkali.

*Recommendations.*—The annual operation and maintenance expenses should be collected. When not collected, it is a forced loan. Satisfactory credit is needed on this project but it should not be provided out of the operation and maintenance allotment. The present private debts should be refunded providing more liberal terms of repayment. Some progress has already been made to that end. A competent economic advisor is needed on this project. This will help bring about better farming and more livestock on farms. His duties would include placing settlers on the land and giving them practical advice afterwards. New settlers should be selected in accordance with their farming experience, capital, and other desirable characteristics.

The situation on the Willwood division shows the need of giving special attention to settlement. About 10,000 acres of this division are admirably suited to irrigated agriculture, but there are no applicants for farms. An economic report states that it will require \$6,000 to \$7,500 to change 80 acres of raw land into a farm. Thus far no provision for giving either practical advice or financial aid has been made.

### OPERATIONS DURING THE FISCAL YEAR

During the season of 1924 the Bureau of Reclamation continued the operation and maintenance of the irrigation systems on the projects except the Salt River project in Arizona and the gravity division of the Minidoka project in Idaho. These have been taken over and are being operated by the water users. On the Strawberry Valley project in Utah, the bureau operates and maintains only the reservoir, main canal, and power plant, the distribution system being handled by the water users.

Out of the total irrigable area of 1,805,730 acres, 1,290,890 acres were irrigated, and 1,216,610 acres cropped. The gross value of crops produced on project lands was \$66,488,560, or \$54.65 an acre. Additional lands served through Government works with a full or partial water supply under Warren Act contracts amounted to 1,237,800 acres, of which 889,460 acres produced crops with a gross value of \$43,237,470, or \$49.28 an acre. The total value of crops grown under Federal irrigation works was therefore nearly \$110,000,000.

Owing to the extreme drought in the Pacific Coast States, the Okanogan and Orland projects had only about one-third of the normal water supply. Crop losses for the season were considerable. Further losses will result through damage to trees which will be reflected in 1925 crops. On the Newlands project the lands dependent on Truckee River water suffered a serious water shortage which was partially relieved by pumping from Lahonton and Lake Tahoe. Otherwise an ample water supply was available. Many of the storage reservoirs constructed by the bureau more than paid for themselves in this one season by insuring full crops on projects where otherwise very little crop production would have been possible.

## ORLAND PROJECT, CALIFORNIA

11541

AVERAGE ALTITUDE  
250 FEET  
TEMPERATURE RANGE  
-21° TO +114° F

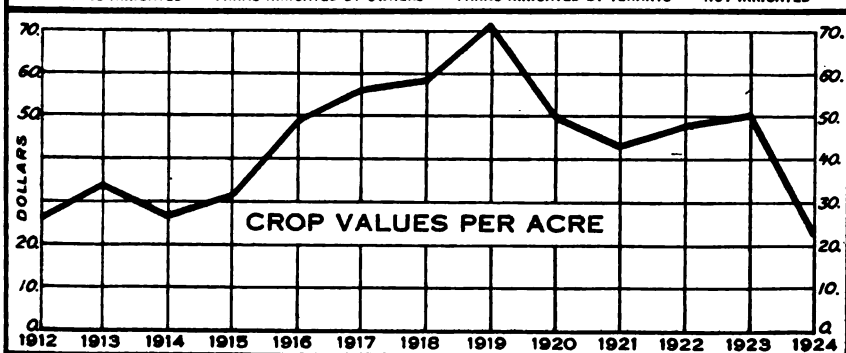
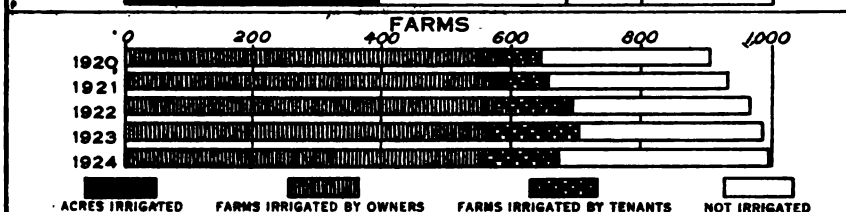
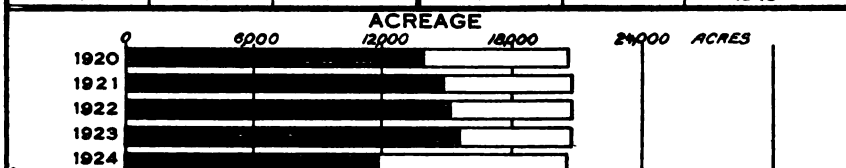
AVERAGE GROWING SEASON  
267 DAYS  
AVERAGE ANNUAL PRECIPITATION  
17.8 INCHES

## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	449	\$9,855	\$19.95
HAY AND FORAGE	7,504	144,260	19.22
VEGETABLES AND TRUCK	5	1,060	212.00
FRUIT AND NUTS	2,429	69,775	28.73
TOTAL	10,387		
DUPLICATED LAND ACREAGE*	417		
LAND ACREAGE CROPPED	9,970	\$224,950	\$22.56

\* ON 417 ACRES TWO OR MORE CROPS WERE GROWN DURING THIS CROP SEASON

POPULATION			LIVESTOCK		
YEAR	ON FARMS	IN TOWNS	DAIRY CATTLE	SHEEP	HOGS
1914	1,100	1,350	2,549	565	2,400
1915	1,600	1,500	3,257	505	4,047
1916	1,700	1,550	3,447	634	2,865
1917	1,900	1,550	2,914	762	2,665
1918	2,000	1,600	2,586	3,335	3,163
1919	2,250	1,700	2,589	1,650	4,644
1920	2,200	1,700	2,014	1,848	2,973
1921	2,250	1,700	2,368	1,663	1,417
1922	2,275	1,700	2,655	1,349	2,151
1923	2,300	1,700	2,991	1,840	2,511
1924	2,100	1,700	2,466	667	1,843





## UNCOMPAHGRE PROJECT COLORADO

11555

AVERAGE ALTITUDE  
5,500 FEET  
TEMPERATURE RANGE  
-10° TO +95° F

AVERAGE GROWING SEASON  
214 DAYS  
AVERAGE ANNUAL PRECIPITATION  
9.50 INCHES

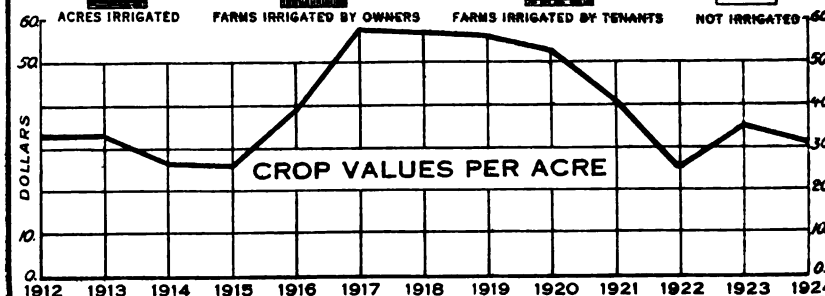
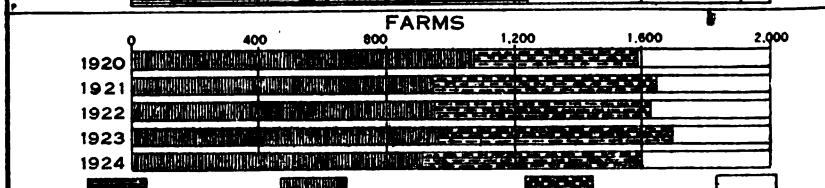
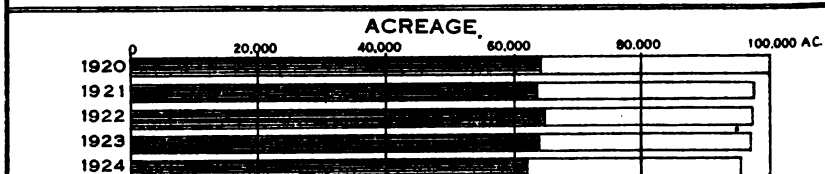
## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	14,512	\$304,207	\$20.97
HAY AND FORAGE	31,114	475,076	15.27
VEGETABLES AND TRUCK	11,252	696,856	61.93
FRUITS AND NUTS	1,875	125,291	66.82
SUGAR BEETS	5,934	324,082	54.61
MISCELLANEOUS *	330	16,088	48.75
TOTAL	65,017		
DUPLICATED LAND ACREAGE*	2,917		
LAND ACREAGE CROPPED	62,100	\$1,941,600	\$31.26

\* ON 2,917 ACRES TWO OR MORE CROPS WERE GROWN DURING THIS CROP SEASON

POPULATION			LIVESTOCK		
YEARS	ON FARMS	IN TOWNS	DAIRY CATTLE	SHEEP	HOGS
1914	2,942	6,500	5,719 *	14,710	4,941
1915	3,561	6,500	2,317	16,335	10,882
1916	4,403	6,700	3,139	41,473	13,729
1917	4,613	6,950	3,310	34,251	9,948
1918	5,279	6,950	4,166	21,356	12,817
1919	5,471	6,950	3,804	14,111	11,432
1920	6,015	7,450	3,370	10,756	8,934
1921	6,166	7,450	3,483	18,166	5,936
1922	6,149	7,450	4,276	16,745	8,790
1923	6,097	7,450	4,501	7,771	9,714
1924	5,822	7,400	5,138	13,945	8,828

\* BEEF AND DAIRY CATTLE



## RIO GRANDE PROJECT, N. MEX.-TEXAS

21 334

AVERAGE ALTITUDE  
3,700 FEET  
TEMPERATURE RANGE  
-5° TO +105° F

AVERAGE GROWING SEASON  
255 DAYS  
AVERAGE ANNUAL PRECIPITATION  
10 INCHES

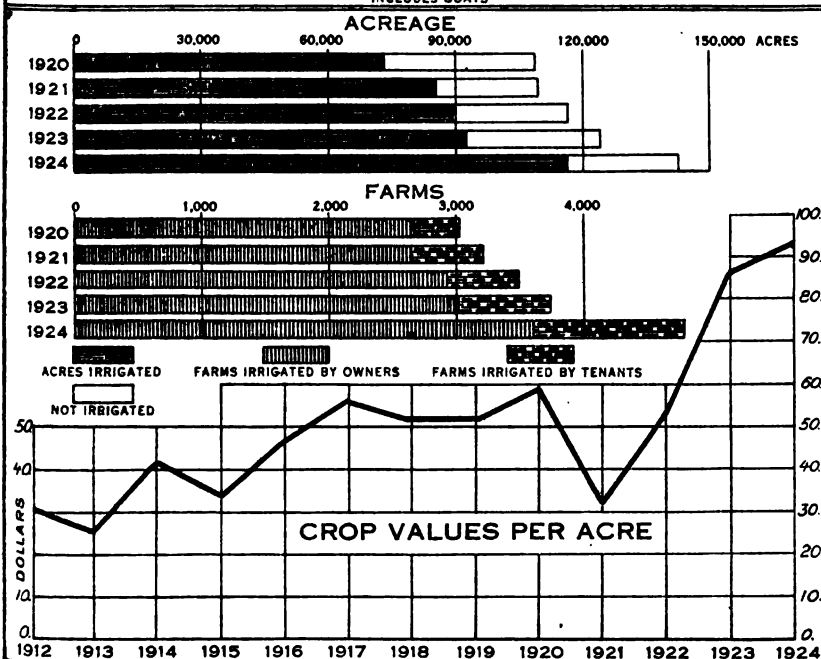
## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	4,153	\$140,254	\$33.77
HAY AND FORAGE	33,743	1,817,915	54.00
VEGETABLES AND FRUIT	4,833	473,936	98.00
FRUITS AND NUTS	1,777	160,045	146.34
COTTON	58,721	7,010,952	119.40
MISCELLANEOUS	129	21,468	116.42
TOTAL	103,356		
DUPLICATED LAND ACREAGE *	236		
LAND ACREAGE CROPPED	103,120	\$9,624,570	\$93.33

\* ON 236 ACRES TWO OR MORE CROPS WERE GROWN DURING THIS CROP SEASON

POPULATION			LIVESTOCK		
YEAR	ON FARMS	IN TOWNS	CATTLE	SHEEP*	HOGS
1914	6,642	78,135	1,740	103	4,189
1915	10,000	80,000	2,459	1,286	6,096
1916	10,431	86,331	3,813	7,000	8,324
1917	10,500	86,600	3,815	6,805	7,677
1918	10,600	86,950	4,198	4,476	15,560
1919	12,890	89,316	5,347	5,287	9,225
1920	12,199	95,083	4,857	2,865	10,123
1921	11,774	101,235	6,832	5,073	6,307
1922	11,267	110,442	8,435	3,940	6,532
1923	15,925	111,883	7,733	3,379	4,573
1924	28,000	106,000	7,337	1,418	1,510

\* INCLUDES GOATS



# KLAMATH PROJECT, OREG.-CALIF.

21937

AVERAGE ALTITUDE  
4,100 FEET  
TEMPERATURE RANGE  
-10° TO +100° F

AVERAGE GROWING SEASON  
153 DAYS  
AVERAGE ANNUAL PRECIPITATION  
12.8 INCHES

## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	3,040	\$61,475	\$20.22
HAY AND FORAGE	28,657	670,181	23.40
VEGETABLES AND TRUCK	581	49,764	85.65
FRUIT AND NUTS	2	400	200.00
MISCELLANEOUS	430	10,750	25.00
TOTAL	32,710	\$792,570	24.23

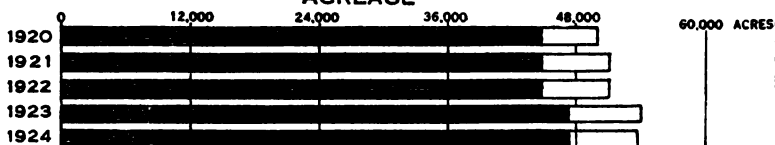
## POPULATION

YEAR	ON FARMS	IN TOWNS
1914	1,375	4,500
1915	1,520	4,700
1916	1,580	5,000
1917	1,610	5,700
1918	1,800	5,000
1919	2,000	5,300
1920	2,050	5,500
1921	2,200	5,800
1922	2,200	6,200
1923	2,600	7,000
1924	2,600	7,000

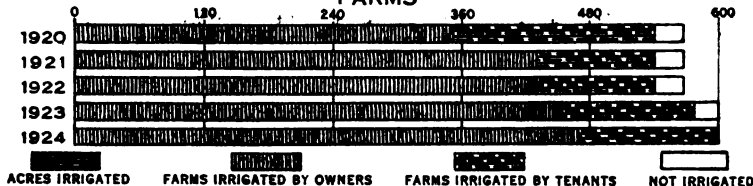
## LIVESTOCK

YEAR	CATTLE	SHEEP	HOGS
1914	4,660	361	6,542
1915	4,171	1,413	7,546
1916	5,583	3,879	3,681
1917	3,000	8,147	3,423
1918	3,082	10,861	3,522
1919	2,779	23,763	2,762
1920	6,503	29,006	2,720
1921	6,328	10,442	1,818
1922	3,400	8,000	2,242
1923	3,403	15,026	2,826
1924	5,846	20,600	1,986

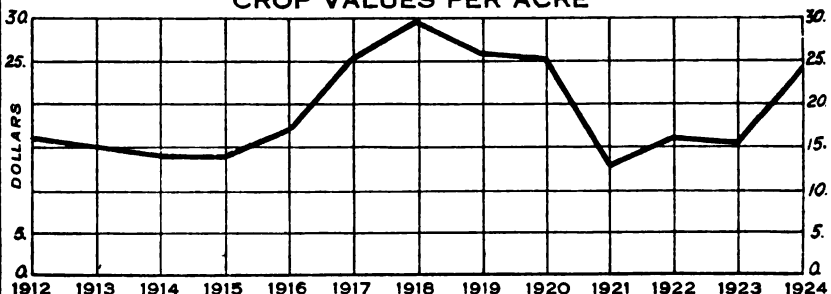
## ACREAGE



## FARMS



## CROP VALUES PER ACRE



## BELLE FOURCHE PROJECT, S. DAKOTA

21538

AVERAGE ALTITUDE  
2,800 FEET  
TEMPERATURE RANGE  
-38° TO +108° F

AVERAGE GROWING SEASON  
130 DAYS  
AVERAGE ANNUAL PRECIPITATION  
15 INCHES

## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	14,353	\$202,097	\$14.08
HAY AND FORAGE	34,581	293,767	8.50
VEGETABLES AND TRUCK	224	13,824	61.71
SUGAR BEETS	1,281	86,249	67.33
MISCELLANEOUS	71	1,153	16.24
TOTAL	50,510		
DUPLICATED LAND ACREAGE*	700		
LAND ACREAGE CROPPED	49,810	\$597,090	\$11.98

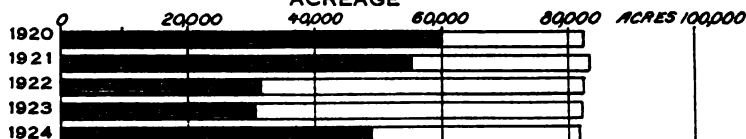
\* ON 700 ACRES TWO OR MORE CROPS WERE GROWN DURING THIS CROP SEASON

## POPULATION

## LIVESTOCK

YEAR	ON FARMS	IN TOWNS	DAIRY CATTLE	SHEEP	HOGS
1914	2,360	2,050	1,578	25,740	11,988
1915	2,375	2,050	2,200	26,210	14,798
1916	2,375	1,775	2,870	32,152	13,631
1917	2,400	1,845	2,912	36,459	10,946
1918	2,400	1,775	3,390	35,607	9,007
1919	2,675	2,200	2,421	75,398	19,837
1920	2,700	2,350	2,969	34,781	11,037
1921	2,700	2,386	3,870	48,510	13,260
1922	2,700	2,386	3,778	40,039	12,792
1923	2,500	2,350	4,138	55,233	16,064
1924	2,020	2,350	4,509	45,350	7,979

## ACREAGE

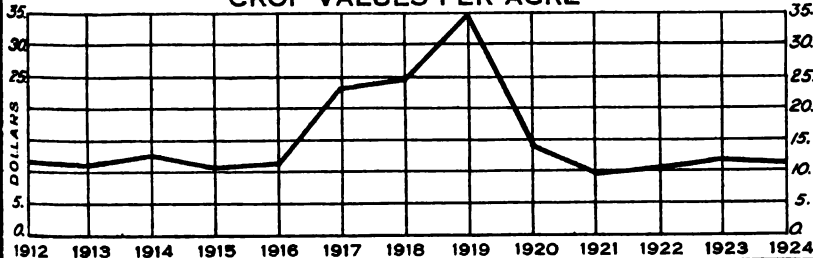


## FARMS



ACRES IRRIGATED      FARMS IRRIGATED BY OWNERS      FARMS IRRIGATED BY TENANTS      • NOT IRRIGATED

## CROP VALUES PER ACRE



## YAKIMA PROJECT WASHINGTON

21530

AVERAGE ALTITUDE  
SUNNYSIDE DIV. 700 FEET  
TIETON DIV. 2100 FEET  
TEMPERATURE RANGE -26° TO 104°F

AVERAGE GROWING SEASON  
SUNNYSIDE 214 DAYS; TIETON 184 DAYS.  
AVERAGE ANNUAL PRECIPITATION  
6-8 INCHES

## CROPS 1924

ITEM	ACREAGE CROPPED	VALUE OF CROP	VALUE PER ACRE
CEREALS AND OTHER GRAINS	13,405	\$445,931	\$33.26
HAY AND FORAGE	60,876	1,450,249	24.00
VEGETABLES AND FRUIT	10,590	1,751,596	165.40
FRUITS AND NUTS	22,678	4,250,895	187.50
SUGAR BEETS	272	2,070	7.61
MISCELLANEOUS	937	217,899	232.55
TOTAL	108,758		
DUPLICATED LAND ACREAGE*	6,078		
LAND ACREAGE CROPPED	102,680	\$8,118,640	\$79.06

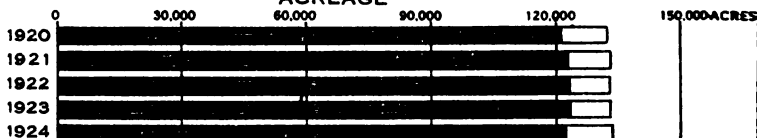
\*ON 6,078 ACRES TWO OR MORE CROPS WERE GROWN DURING THIS CROP SEASON

## POPULATION

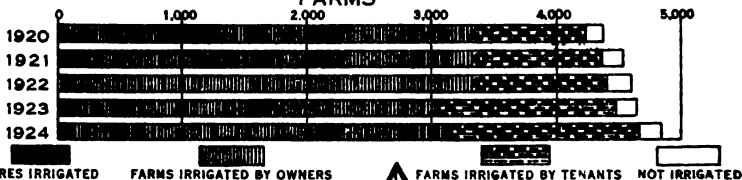
## LIVESTOCK

YEAR	ON FARMS	IN TOWNS	CATTLE	SHEEP	HOGS
1914	8,816	23,300	10,392	2,029	28,938
1915	9,370	24,460	13,410	6,897	38,127
1916	10,094	25,268	16,118	6,744	22,681
1917	10,150	25,850	13,998	8,412	18,050
1918	10,405	27,400	11,897	10,088	21,855
1919	12,327	30,650	11,367	10,438	19,464
1920	14,243	29,941	13,005	6,464	18,141
1921	15,537	29,941	12,361	6,037	12,702
1922	15,874	30,250	14,774	5,947	14,535
1923	13,581	30,250	15,464	6,159	21,727
1924	13,097	30,410	16,415	10,261	16,404

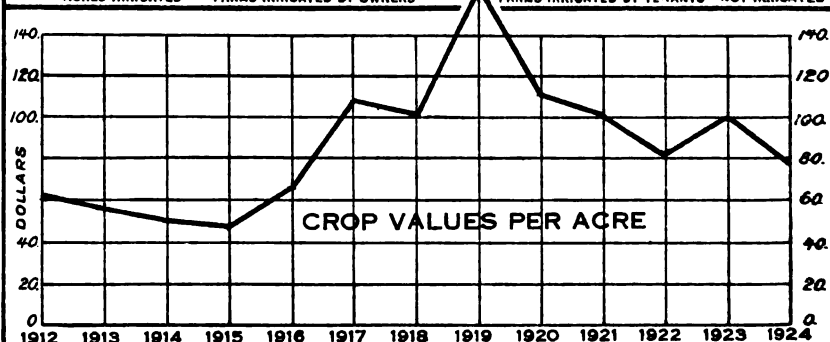
## ACREAGE



## FARMS



ACRES IRRIGATED      FARMS IRRIGATED BY OWNERS      FARMS IRRIGATED BY TENANTS      NOT IRRIGATED



The Salt River project, in Arizona, operated by the Salt River Valley Water Users' Association, continued a construction program of additional water storage and power development.

On the Yuma project, in Arizona and California, construction was started on works to protect the main canal from floods at Picacho and Un-named washes. Funds were appropriated for the construction of a power plant at the syphon drop in the main canal and advertisement for construction of this plant was issued at the end of the fiscal year. Crop returns were very satisfactory, averaging nearly \$85 per acre.

On the Orland project, in California, a serious water shortage was experienced, but very little permanent loss resulted to either fruit trees or alfalfa. Despite these conditions the water users made a splendid record in payment of charges. Plans are being made to provide additional storage.

On the Grand Valley project, in Colorado, good progress was made on the reconstruction of the Orchard Mesa irrigation system. This was taken over after failure under private construction and included as a unit of the project. The water supply in the Gunnison and Uncompahgre Rivers, although the shortest experienced for many years, was sufficient, with careful handling, for the needs of the Uncompahgre project. Crop returns were satisfactory on both projects.

On the Boise project, in Idaho, work was continued on drainage construction and on betterments of the main canal. The construction of the Black Canyon Dam was completed and water diverted to the canals of the Emmett irrigation district. The construction of a power plant at this dam was authorized and was about 65 per cent complete at the end of the fiscal year. Conditions on the King Hill project were improved by good crops and satisfactory prices. On the Minidoka project active work was begun on the American Falls Reservoir by the Utah Construction Co. Work was completed on improvements in the new townsite of American Falls and the moving of houses from the old town to the new was continued.

The Huntley project, in Montana, was operated under public notice. The Milk River project was operated on a rental basis. Construction work was commenced on the second barrels of the pipe syphon crossings on the St. Mary Canal, which were originally constructed only to a partial capacity. A beet-sugar factory which has been established on this project will materially assist in the agricultural development. On the Sun River project, the Fort Shaw division was operated under public notice and the Greenfields and Big Coulee divisions under water-rental contracts. Additional storage will be required to make profitable production on this project certain. On the Lower Yellowstone project in Montana and North Dakota, the building of a beet-sugar factory, which is in progress, will be of assistance in improving agricultural conditions.

On the North Platte project, in Nebraska and Wyoming, construction work on the Fort Laramie division was completed in the spring of 1925. Work was continued on the replacement of structures on the interstate division. Construction of the Guernsey Dam was begun.

On the Newlands project, in Nevada, the water supply for the lands irrigated from the Carson River was ample. A severe shortage, however, occurred on some 3,000 acres of the Truckee division, which were wholly dependent on Truckee River waters. Pumping from the Lahonton Reservoir and also from Lake Tahoe was resorted to in order to prevent serious loss. Crop results were in general satisfactory. Investigations were continued into the possibility of providing water for new lands from the proposed Spanish Springs Reservoir and for such of the older project lands as may want supplemental water supply.

On the Carlsbad project, in New Mexico, investigations were in progress for additional storage on the Pecos River.

On the Rio Grande project, in New Mexico and Texas, the beneficial results of the construction of the complete drainage system are apparent and the irrigated area was increased from 92,000 acres in 1923 to 131,000 acres in 1924. The progress in settlement and cultivation of project lands was very satisfactory and the crop returns were much larger than for the previous year.

The Williston project, in North Dakota, continued to be operated at a loss and steps were being taken to have the project appraised and sold to the highest bidder.

On the Umatilla project, in Oregon, active construction to provide an additional water supply was in progress on the McKay Reservoir. The Furnish and Westland projects have contracted for the purchase of 44,250 acre-feet of storage from the reservoir. Other operative and proposed projects and extensions of the Furnish and Westland districts need in the aggregate more than the balance of storage remaining. It was decided to base the apportionment of the remaining storage on the relative results to be expected from the use of the water on various areas. To this end an engineering report dealing with requisite water supply and cost of construction was made in June, 1925, and an investigation of agricultural and economic features is in progress.

On the Klamath project, in Oregon and California, construction work was in progress on the Tule Lake division to provide lateral and drainage systems for additional lands lying below the 10,000 acres opened to entry in 1922.

The Belle Fourche project, in South Dakota, was operated under public notice based on the contract with the newly organized irrigation district. Owing to lack of rainfall the demand for irrigation water was heavier than for some years and the irrigated area was increased to 48,400 acres.

On the Strawberry Valley project, in Utah, water was delivered in bulk at the head gates at the various canals which were operated by the canal companies and irrigation districts. The irrigated area was increased to 41,000 acres which was the largest in the history of the project.

The Okanogan project, in Washington, again suffered a water shortage, only about one-half of the desirable supply being available. Resort was had to pumping water by means of temporary plants and serious crop loss was by this means averted. On the Yakima project the Tieton Dam was completed. Investigations were continued on the proposed Kittitas extension. An economic survey and report, drainage report, and preliminary engineering report were made

On the Riverton project, in Wyoming, the heavy construction work was completed far enough to permit delivery of water to the first division of 15,000 acres as soon as the distribution system is constructed. The construction program on this project is being slowed down pending settlement of the lands for which water is first made available. On the Shoshone project, construction was continued on the drainage systems in the Garland and Frannie divisions and on the canal and lateral systems for the new Willwood division.

One index of the bureau's activities during the year is the number of contracts entered into and the different subjects involved, which are summarized in the following table:

Nature of contracts <sup>1</sup>	Number of contracts	Amount involved
Cooperative investigations.....	16	\$128, 100. 00
Supplies.....	1, 009	614, 887. 09
Material.....	399	953, 108. 80
Equipment.....	201	511, 295. 03
Miscellaneous services.....	216	310, 451. 71
Construction work.....	144	3, 686, 920. 19
Land purchases, including improvements.....	264	662, 827. 05
Land sales, including improvements.....	187	77, 170. 00
Leases to the United States.....	51	8, 689. 60
Leases from the United States.....	387	68, 912. 24
Compromise of damages.....	27	7, 741. 82
Rental of Government equipment.....	66	7, 503. 03
Rental of water.....	594	136, 534. 12
Sale of surplus electrical energy.....	38	236, 208. 52
Sale of water rights to towns.....	1	220. 50
Sale of water rights under the Warren Act <sup>2</sup> .....	9	1, 056, 781. 90
Sale of water rights within projects.....	84	245, 942. 13
Miscellaneous.....	180	318, 895. 33
Total.....	3, 853	\$ 8, 982, 153. 56

<sup>1</sup> Does not include adjustment and relief measures.

<sup>2</sup> Includes some construction work.

<sup>3</sup> Estimated in part.

## PREPARATION FOR NEW CONSTRUCTION

In the discussion of existing projects, recommendations are made for measures to relieve some projects of a part of their financial burden and on others to bring about closer settlement and better cultivation. Some of these measures would involve large expenditures. The policy adopted for old projects is important in connection with building new ones.

At its last session, Congress made appropriations for beginning construction on six new projects or divisions of old projects and storage for two others. The acre cost of these new projects, except the Salt Lake Basin in Utah, will be materially larger than on the present projects. Difficulties of settlers in meeting payments on these raises the question of what can be done to help settlers on costlier new undertakings to succeed.

A study of economic conditions and of measures needed to promote settlement and farm development on new projects is required under the amended reclamation act of December 5, 1924. The entire staff of the division of reclamation economics, with assistance from the United States Department of Agriculture, has been engaged in making soil surveys and classifying the land on these new projects. Arrangement for the organization of districts or associations and negotiation of contracts for the repayment of money spent by the Government, are in process of completion.



## INVESTIGATIONS OF PROPOSED PROJECTS

### SPANISH SPRINGS DIVISION (NEWLANDS PROJECT), NEVADA

Congress appropriated \$500,000 for the construction of the Spanish Springs division of the Newlands project. This is contingent on a contract with districts to be organized for repayment of costs, on appraisal of and fixing of satisfactory selling prices and terms for Southern Pacific Co. lands, and on agreement for advance payments of operation and maintenance charges. The appropriation also reserves priority in water rights for present water users of the Newlands project, on exemption of Lahontan lands from assessment of costs of Spanish Springs division, and the application of power earnings within the Spanish Springs division towards repayment of construction costs on that division. The Secretary is also authorized to contract with the State or others for aid by them in promoting development and settlement, including the necessary financing.

A report on agricultural and economic feasibility was completed in November, 1924. The area of irrigable land under the Spanish Springs development, including 7,235 acres within the Truckee division of the present Newlands project requiring a supplemental water supply, is estimated at 46,600 acres. A storage capacity at Spanish Springs site not exceeding 200,000 acre-feet will be required for this area. The cost of the project is estimated at \$6,291,000, of which \$5,067,000 is for new construction, and \$1,224,000 is for past expenditures chargeable against new acreage.

Final surveys for the location of the feed canal for Spanish Springs Reservoir were completed, resulting in the choice of the high-level line to avoid excessive costs in passing through the city of Reno. There will be a drop at the end of the canal of at least 85 feet to the maximum water level of the reservoir. It is proposed to utilize this head for the production of power to make good to the Truckee River Power Co. such reduction of power output as may result at their Reno power plant, through the diversions above, by the Spanish Springs feed canal. Negotiations are in progress for purchase of the plant or exchange of power. A detailed classification of Government and private lands possible of development from Spanish Springs Reservoir is in progress. Appraisal of Southern Pacific lands will also be made. The appraisal of the Indian lands has been delayed pending appointment of representative by the Indian Bureau. This bureau does not desire to proceed with allotments of irrigated land for Indians as provided by the act of April 21, 1904 (33 Stat. 189). This makes additional legislation necessary.

### BAKER PROJECT, OREGON

The sum of \$490,000 remaining from a previous appropriation was reappropriated for the fiscal year 1926.

Following the report on land classification and economics the engineering estimates were revised in October, 1924, for the reduced acreage. The capacity of the reservoir has been reduced to 80,000 acre feet, but canal capacities were retained as in the engineering report of January, 1923. The estimated total cost of the project is \$3,700,000. About 27,000 acres will be benefited. It is expected

that the railroad company will pay one-half the cost of raising the track through the reservoir and reduce the above total by about \$100,000.

Construction work has not been undertaken under former appropriations by Congress because convincing evidence of feasibility is lacking. Additional reports and investigations made have but served to increase the doubt of feasibility indicated by former investigations. The construction of the project could not be justified under present conditions. Form of proposed contract with the Lower Powder irrigation district has been tentatively approved subject to the qualification that the department is not to be regarded by such action as committed to the construction of the project until all necessary requirements have been met and more convincing evidence of feasibility obtained.

#### VALE PROJECT, OREGON

Congress has appropriated \$500,000 for the project. This is contingent on a contract with districts for repayment of the cost. State aid in the selection and financing of settlers is also required.

Final report on the agricultural and economic features was made in 1924. The total area of the project comprises 31,920 acres. The cost is estimated at \$3,600,000.

Topographic mapping of the irrigable lands and a complete land classification for use in planning a distribution system was begun in May, 1925. The Oregon State Legislature at the request of the bureau and other interested parties enacted legislation for the purpose of facilitating sale by the Warm Springs irrigation district of storage rights and capacity in Warm Springs Reservoir for use on the Vale project. The State engineer subsequently made official finding that the district would be justified in disposing of one-half of the capacity of the reservoir. The ability of the irrigation district to convey to the United States title required by applicable acts of Congress to the desired quantity of water is not free from doubt. This matter is now receiving careful consideration by the legal advisers of the department. As a large part of the project land is controlled by two companies and the success of the project, in no little degree, will be dependent on the cost of raw land to the settler, negotiations for the sale of these lands at agreed prices have been under discussion with the large landowners.

#### OWYHEE PROJECT, OREGON-IDAHO

The sum of \$315,000 remaining from a previous appropriation was reappropriated for the fiscal year 1926.

A report on the agricultural and economic feasibility of the project was made in 1924. The area to be supplied with water is 138,400 acres. The cost is estimated at \$17,715,000.

Drilling of foundations and geological examination of the site of the diversion dam was completed and indicates a favorable site with a maximum cover to bedrock of 62 feet. Further studies and designs confirmed the choice of raising the diversion dam to provide storage in lieu of a separate reservoir at the Duncan Ferry site. The preliminary location of the main canals leading from the dam was completed and some engineering work was done on intermediate distributary canals and topographic mapping of irrigable areas. Construction roads were surveyed.

Forms of contracts for the inclusion of lands now receiving water by pumping from Snake River and to furnish supplemental water for lands under the Owyhee Ditch have been under consideration, as has also the formation of an irrigation district embracing all dry lands not now in existing districts.

Negotiations are in progress with the owners of large tracts of land in the project with a view to fixing prices and terms for transfer of these lands to actual settlers.

#### **SALT LAKE BASIN PROJECT, UTAH**

On December 5, 1924, Congress appropriated \$375,000 for the continuance of investigation and construction. By act of March 3, 1925, the unexpended balance was reappropriated. An additional appropriation of \$900,000 was made for construction conditioned on the organization of a district or association to make a contract for repayment of construction costs and for advance payment of operation and maintenance charges.

The committee appointed to review existing conditions recommended the construction of the Echo Reservoir and the diversion canal from the Weber River to Provo River. A capacity of 74,000 acre-feet was adopted for the reservoir. This is the maximum capacity feasible on account of the proximity of the town of Coalville and complications in the removal of existing roads and railroads. The estimated cost of this first development is \$3,000,000.

Relocation surveys have been made for the reconstruction on higher ground of about 5 miles of the Park City branch of the Union Pacific Railway now located through the bed of the proposed reservoir. A location satisfactory to the railroad company was obtained. Relocation surveys are in progress for the removal of the Lincoln Highway, which also traverses the reservoir bed. Designs for the Echo Reservoir have been practically completed.

Preliminary alternate locations for the diversion canal connecting the Weber and Provo Rivers across the Kamas Bench have been made. The final capacity of the canal will depend somewhat on the feasibility of storage on the Provo River. Tentatively it is proposed to provide a present capacity of 300 second-feet. This will be ample unless storage capacity is provided on the Provo River for Weber River flood waters not required for the Echo Reservoir. Provision is made for subsequent enlargement to a capacity up to 1,000 second-feet.

The canal companies and individuals which will benefit by this first development have elected to form a water users' association and guarantee repayment of expenditures of the Government by establishing a lien based on their irrigation systems and water rights. Amendments of articles of incorporation for this purpose are in progress. The association has not been organized. Tentative draft of contract to be entered into between the Government and the association, when organized, has been approved by the department.

#### **KITTITAS DIVISION, YAKIMA PROJECT, WASHINGTON**

By act of Congress of December 5, 1924, the sum of \$375,000 was appropriated for this division. On March 3, 1925, this was reappropriated, with \$375,000 additional. The latter appropriation was conditioned on a contract with a district for repayment of construction

costs, for the sale of lands within the district at appraised prices, and for the payment of operation and maintenance charges in advance. It was also provided that the State should enter into a contract to promote and finance land settlement and development.

An agricultural and economic survey of the project was made in 1924. The irrigable area comprises about 70,000 acres. The cost is estimated at \$11,100,000, of which \$8,800,000 is for new construction and \$2,300,000 for past expenditures, including storage, chargeable against new acreage.

Soil surveys were started in March and land classification in June, 1925, but are expected to be completed during the calendar year. Further drainage investigations have been carried on, and geologic reports have been made on the Easton dam site, siphon crossing, and tunnels.

Location of main canals and topographic mapping of irrigable areas are practically completed. The site of the diversion dam near Easton was diamond drilled for foundation conditions. Topographic surveys of the project area to serve as a basis for land classification and for future construction of the distribution system have been completed. The principal structures have been designed.

By contract made in 1921 with the United States the district assumed repayment of storage costs. On February 11, 1925, the district favorably voted a contract covering repayment to the United States of the cost of the distribution system, estimated at \$9,000,000. This contract was confirmed by court on March 10, 1925. The Governor of Washington, however, refused to enter into a contract providing for land settlement by the State, and landowners within the district obtained an injunction against execution of the contract on account of the land-sale feature of the contract, both of which are required by the above legislation.

## DIVISION OF RECLAMATION ECONOMICS

The division of reclamation economics was organized to deal with agricultural and economic phases of reclamation. Five employees were engaged on the work in Denver and four in the headquarters office in Washington.

### LAND CLASSIFICATION

The act of December 5, 1924, authorizes the Secretary of the Interior to classify the land into productive zones on the projects desiring to receive the benefits of this law. Land classification accordingly has been in progress on the Grand Valley and Uncompahgre projects, Colorado; Boise, Minidoka, and King Hill projects, Idaho; Huntley, Milk River, Sun River, and Lower Yellowstone projects, Montana; North Platte project, Nebraska-Wyoming; Newlands project, Nevada; Umatilla and Klamath projects, Oregon; Belle Fourche project, South Dakota; Strawberry Valley project, Utah; Okanogan and Yakima projects, Washington; and Shoshone project, Wyoming. The land classification work was about 85 per cent completed at the end of the fiscal year.

The following classes were generally adopted on the projects, although on some projects it was found advisable to have only three producing classes:

*Class 1.*—Lands that with sufficient water and under approved systems of tillage produce the best crops on the project, and that have such even topography that they may be easily irrigated, with a minimum of leveling and labor under the approved system of irrigation practice for the project. These are the best lands on the project, of good soil and good topography.

*Class 2.*—Lands of the same productive power as those in class 1, but with a topography so uneven as to require more expense and more labor in the tillage and irrigation of the fields. Such lands because of their topographic difficulties are generally less capable of sustaining a completely diversified kind of agriculture. These are usually good lands of poor topography.

*Class 3.*—Lands of lower fertility or productive power, even with ample water and under good systems of husbandry, than those of the above classes. These lands may have an even topography, and therefore are easily irrigated, but are incapable of producing the yields of the lands under classes 1 and 2. The cause of this infertility may be inherent in the soil or may be due to alkali, gumbo, blow sand, shale, shallow or porous soil, or other factors characteristic of the project. These are poor lands, often of good topography.

*Class 4.*—Lands of poorer productivity than those of Class 3, or of the same grade as Class 3, but with such unfavorable topography as to increase the expense of cultivation and irrigation and to decrease the crop yield. These are poor lands, of poor topography, often with excessive slopes.

*Class 5.*—Lands that are not at present susceptible of agricultural use, but which may gradually by tillage and under changing conditions be made sufficiently productive to justify cropping. Included in this class are alkali and water-logged lands that may be improved by drainage; excessively heavy soils that may be improved by the incorporation of organic matter or indirect fertilizers; light sandy soils that may be firmed by plant roots; steep soils that may be leveled; and other similar soils.

*Class 6.*—Lands that appear to be permanently nonagricultural under the practices of irrigation farming.

#### SETTLEMENT AND DEVELOPMENT ACTIVITIES

Progress in settlement of existing projects has been slow and discouraging. Only one project (the Rio Grande, New Mexico-Texas) has received any considerable number of settlers. This was the outcome of coordinated effort by the Gateway Club, El Paso, Tex., the Santa Fe Railroad, and district organizations. By advertising in more than 500 papers and periodicals circulating throughout the United States and Canada and by personal solicitation, from 600 to 800 settlers were secured.

Some of the railroad companies serving the projects have been quite active, but report that the results are disappointing.

Conferences were held with railroads, chambers of commerce, and water users organizations to devise a coordinated plan under which private lands offered for sale would be appraised by a competent

local board and sold under terms and conditions in conformity with the earning power of the land; that advertising be done cooperatively, clearly, and truthfully, describing the opportunities offered; and that care be exercised in the selection of settlers. Four projects are endeavoring to form such organizations and have shown active interest in obtaining purchasers for lands now farmed by tenants or abandoned.

Representatives of the division of reclamation economics have met with organizations of water users and business men in regard to the extension of cooperative marketing. Conferences were also held with bankers and commercial organizations in regard to long time and intermediate credit. As a result, the growth and influence of these institutions have increased during the year.

### LEGAL ACTIVITIES

In the construction, operation, and maintenance, and administration of Federal irrigation projects, the bureau is confronted with an array of legal problems. Settlement of water rights, preparing contracts for the building of irrigation works, purchase of machinery, equipment, and other materials, acquisition of rights of way and easements over lands needed for project development, are matters requiring the services of members of the legal profession. There are 14 attorneys in the bureau, 4 at the Washington headquarters and 10 in the field, located at Berkeley, Calif.; Denver and Montrose, Colo.; Boise, Idaho; Billings, Mont.; Mitchell, Nebr.; Portland, Oreg.; and El Paso, Tex.

A large part of the work devolving upon the law officers of the bureau during the latter part of the fiscal year had its origin in the act of Congress approved December 5, 1924, popularly known as the "fact finders' law." A bill embodying the recommendations of the special advisers on reclamation, after introduction was amended in certain respects and the bill was attached to and passed as a part of the second deficiency act, fiscal year 1924.

The necessity for interpretation of doubtful provisions soon became apparent. A study of the various provisions was promptly made by the law officers of the bureau and within a short time the department construed for the guidance of all concerned those provisions hedged with uncertainty.

Unfortunately certain important provisions are not free from ambiguity, which makes it difficult for the department to administer the law. Further action by Congress may become necessary in order to clarify those provisions now fraught with uncertainty. It is highly desirable that the law be made so plain that there will be no room for uncertainty either on the part of administrative officers or water users. Specific recommendation upon this subject will be made to Congress at the proper time.

Regulations necessary to effectuate the various provisions of the law were issued from time to time as necessity arose, but only after mature consideration and with the aid of such experience as could be gained before regulations became urgently necessary to prevent delaying action unduly. This course was considered preferable to

the hasty issuance of regulations which experience might show to be impracticable. The wisdom of this course has been fully vindicated by events in this and in other cases.

The drafting of contracts for making effective the far-reaching provisions of the new law has introduced legal problems unsuspected until the work was undertaken. This task was rendered more complex by contracts of various kinds already outstanding on almost all of the existing projects. The new law necessitates a radical departure from the method formerly in vogue, with which the irrigation district and other State laws had been gradually brought into harmony. Fortunately it appears that it will be possible to operate under the laws of most States without material changes.

In an effort to forestall the inordinate delay and expense usually attendant upon water adjudication proceedings, some of which have consumed a dozen years or more, a new procedure has been inaugurated in connection with the Carson River suit affecting lands in Nevada and California. This suit is necessary for protection of the water supply of the Newlands project. Many of the rights have been already passed upon by administrative officers of the States of Nevada and California and the courts of those States, but such rights have not been coordinated, particularly as between claimants of the States named. By a special act of Congress the courts of either State are empowered to hear and determine all rights. Accordingly a suit has been filed in the United States District Court for the District of Nevada, including owners and claimants of water rights on the watershed in both States. Ordinarily the whole issues are tried *de novo*, necessitating the taking of testimony bearing upon each individual right regardless of the determination already made. In this case it is proposed by stipulation of the parties in interest to adopt the findings heretofore made by the State officials and the courts, supplementing such findings only as to rights not so covered. This, of course, is done only where the interested parties upon investigation are satisfied that the findings so made are substantially correct. The procedure proposed gives promise of saving a tremendous amount of time and expense to the water users affected, at the same time affording necessary protection to all.

In *Nampa and Meridian Irrigation District v. Bond* (decided April 13, 1925) the Supreme Court of the United States had under consideration the distinction between construction charges and operation and maintenance charges on an irrigation project. In 1915 the United States and the district entered into a compact by which the Government constructed certain drains to benefit the lands of the district, which are virtually a part of the Boise Federal reclamation project. In the contract the district agreed to pay the Government the construction charges on certain dry lands called "project lands," of the district. The contract provided that the project lands in the district "shall pay the same operation and maintenance charge per acre as announced by the Secretary of the Interior for similar lands of the Boise project." The Government, after the construction of the project, found that certain lands not in the district were deteriorating by reason of seepage developing. Drains were constructed to relieve this condition, and the cost was assessed as a part of the operation and maintenance charge.

The district objected to the payment of this item in the operation and maintenance bill, and brought a suit to enjoin the superintendent of the Boise project from shutting off water for nonpayment of the charges. The district court dismissed the bill (283 Fed., 569), and its decree was affirmed by the Circuit Court of Appeals (288 Fed. 541). On appeal the Supreme Court upheld the action of the lower courts. Among other things the Supreme Court said:

Expenditures necessary to construct an irrigation system and put it in condition to furnish and properly distribute a supply of water are chargeable to construction; but when the irrigation system is completed, expenditures made to maintain it as an efficient going concern and to operate it effectively to the end for which it was designed, are, at least, generally, maintenance and operating expenses \* \* \*. It is not necessary that each expenditure for maintenance or operation considered by itself shall directly benefit every water user in order that he may be called upon to pay his proportionate part of the cost. If the expenditure of to-day does not especially benefit him, that of yesterday has done so or that of to-morrow will do so. The irrigation system is a unit, to be, and intended to be, operated and maintained by the use of a common fund to which all the lands under the system are required to contribute ratably without regard to benefits specifically and directly received from each detail to which the fund is from time to time devoted.



# DISCUSSION OF PROJECTS

## PRIMARY PROJECTS

### ARIZONA, SALT RIVER PROJECT

The Salt River project irrigates 203,527 acres of land of the shareholders of the Salt River Valley Water Users' Association and 24,998 acres on a rental basis and under the Warren Act, all located in the Salt River Valley, Maricopa County, Ariz. The range of temperature over a period of 35 years was from 22 to 117° with an average annual rainfall of 8.34 inches. The soil varies from sandy to silt and clay loam of great fertility. Farming is highly diversified, the climate permitting cultivation during the entire year. The major crops are cotton, alfalfa, grain, citrus and deciduous fruits, cantaloupes, grapes, small fruits, vegetables, dairy products, etc. Local, Pacific coast, and eastern markets absorb surplus production.

#### *Operation and settlement data, Salt River project*

Item	1921-22	1922-23	1923-24	1924-25
Acreage for which works were prepared to supply water.....	213, 168	213, 170	213, 170	236, 000
Acreage irrigated.....	203, 346. 50	204, 590. 50	204, 590	233, 500
Miles of canals operated.....	863. 35	863. 35	967. 9	975. 55
Water diverted (acre-feet).....	1, 231, 031	<sup>1</sup> 1, 215, 035	<sup>1</sup> 1, 075, 150	<sup>1</sup> 1, 397, 614
Water delivered to land (acre-feet).....	534, 526. 07	566, 715	590, 613	741, 959
Acre-feet per acre for area under cultivation.....	<sup>2</sup> 2. 635	<sup>2</sup> 2. 770	<sup>2</sup> 2. 89	<sup>2</sup> 4. 16
Total number of farms on project (when completed) <sup>3</sup> .....	5, 000	5, 000	5, 500	6, 500
Number of farms reported <sup>4</sup> .....	5, 000	5, 000	5, 500	6, 300
Operated by owners or managers <sup>4</sup> .....			4, 600	5, 400
Operated by tenants <sup>4</sup> .....			900	900
Population.....	38, 000	38, 000	36, 000	39, 000
Number of towns.....	14	14	12	12
Population.....	42, 500	44, 000	51, 000	55, 000
Total population of towns and farms.....	76, 100	80, 000	87, 000	94, 000
Number of public schools.....	60	60	63	65
Number of churches.....	65	65	65	66
Number of banks.....	20	20	15	15
Total capital stock.....	\$1, 755, 500	\$1, 755, 500	\$1, 600, 000	\$1, 600, 000
Amount of deposits.....	\$17, 776, 336	\$21, 331, 600	\$25, 000, 000	\$25, 580, 000
Number of depositors.....	38, 000	39, 500	40, 000	41, 000

<sup>1</sup> Net Salt River Valley Water Users' Association, inclusive of 185,000 acre-feet flood water diverted for power.

<sup>2</sup> Net diverted and developed for irrigation. Does not include water diverted and wasted, water diverted for power, or water delivered to canal systems not a part of the project.

<sup>3</sup> Amount of water per acre actually charged for; 20 per cent less than the amount of water delivered to the land.

<sup>4</sup> Estimated.

<sup>5</sup> Includes population within town-site areas.

#### *Appropriations*

Fiscal year 1925:	
Congressional authorizations.....	\$5, 000
Unencumbered balance June 30, 1925.....	5, 000
Fiscal year 1926: Amount specified in appropriation acts.....	5, 000

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$14,662,033.06	\$0,450.28	\$14,671,484.24
Less collections.....	6,539,933.23		6,539,933.23
Net investment, June 30, 1925.....	8,122,100.73	9,450.28	8,131,551.01

*Construction account*

	Fiscal year 1925	To June 30, 1925
<b>Cost of irrigation works:</b>		
Original construction.....		\$11,292,362.55
Value of works taken over.....		1,451,860.04
Total construction cost.....		12,744,222.59
Operation and maintenance prior to public notice (net).....		115,993.50
		\$12,860,216.09
<b>Less:</b>		
Construction revenues.....		2,312,066.81
Nonreimbursable cost.....		382,097.31
		2,694,164.12
Total to be repaid by water users.....		10,166,021.97
<b>Repayment:</b>		
Contract: Salt River Valley Water Users' Association.....		10,166,021.97

*Status of current accounts receivable June 30, 1925*

	Due		Collected	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
<b>Construction:</b>				
Water right charges.....	\$609,961.32	\$2,306,883.96	\$609,961.32	\$2,306,883.96
Charges paid in advance.....			10,635.34	
<b>Miscellaneous:</b>				
Rentals of irrigation water.....		2,246,726.01		2,246,726.01
Rentals of power and light.....		998,411.03		998,411.03
Rentals of grazing and farming lands.....		19,373.14		19,373.14
Interest and penalties.....			59,907.52	109,684.31
Other.....				858,854.78
Grand total collections.....			659,233.50	6,539,933.23

<sup>1</sup> Contra.**ARIZONA-CALIFORNIA, YUMA PROJECT**

The Yuma project, exclusive of the Mesa division, comprises 65,000 acres of irrigable land for a distance of 38 miles from the boundary between Arizona and Mexico, in Yuma County, Ariz., and Imperial County, Calif. The soils are rich alluvium bottom land. The principal crops are cotton and alfalfa. The irrigation season is 365 days. The average temperatures for 29 years are: High, 115°; low, 28° F.; rainfall, 40-year average, 3.1 inches.

The Mesa division comprises 45,000 acres of mesa land lying about 80 feet above the valley. The soil is sandy and the climate frostless and well adapted to the growing of citrus and other semitropical fruits.

*Operation and settlement data, Yuma project, Arizona-California*

Item	1920	1921	1922	1923	1924
Area for which bureau was prepared to supply water.....	65,000	65,000	67,200	<sup>2</sup> 71,000	<sup>3</sup> 70,500
Acreage irrigated.....	54,550	52,400	53,970	<sup>4</sup> 53,925	<sup>5</sup> 53,843
Miles of canal operated.....	323.2	323.2	345	370.26	370.26
Water diverted (acre-feet) <sup>6</sup> .....	468,900	482,000	546,634	672,867	665,898
Water delivered to land (acre-feet).....	160,330	140,900	140,056	154,271	185,373
Acre-feet to acre for area under cultivation.....	2.94	2.69	2.59	2.90	3.44
Total number of farms on project (when completed).....	5,750	5,750	5,750	5,750	6,000
Number of irrigated farms.....	1,230	1,211	<sup>7</sup> 1,216	1,207	1,304
Operated by owners and managers.....	711	825	762	675	662
Operated by tenants.....	519	386	536	532	642
Population.....	5,100	4,800	4,200	3,800	3,350
Number of towns.....	6	5	5	5	5
Population.....	7,110	6,665	6,700	5,730	6,890
Total population of towns and farms.....	12,210	11,465	10,900	9,530	10,240
Number of public schools.....	15	16	16	16	612
Number of churches.....	<sup>8</sup> 23	<sup>8</sup> 23	<sup>8</sup> 24	<sup>8</sup> 24	15
Number of banks.....	6	5	5	5	5
Total capital stock.....	\$255,000	\$230,000	\$280,000	\$280,000	\$280,000
Amount of deposits.....	\$2,100,000	\$1,927,000	\$3,095,800	\$3,378,330	\$2,664,296
Number of depositors.....	9,175	5,900	6,382	6,970	8,492

<sup>1</sup> Includes Yuma Mesa lands.<sup>2</sup> Project proper, 63,163 acres under public notice; 57,500 acres covered by crop census.<sup>3</sup> Reduction due to error in 1923 which should have been 70,500.<sup>4</sup> Project proper, 53,270 acres.<sup>5</sup> Project proper, 53,180.<sup>6</sup> Of the water diverted, from 100,000 to 200,000 acre-feet each year are wasted, of which the largest part flows into the Colorado River at the California Spillway near Yuma, and this water can be diverted for irrigation further down the river.<sup>7</sup> A few farms operated partly by owners and partly by tenants.<sup>8</sup> Total religious organizations; figures for 1924 are for church buildings only.*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$927,264.77
Disbursements.....	\$406,469.49	
Liabilities outstanding.....	179,166.35	
		585,634.84
Unencumbered balance June 30, 1925.....		341,629.93
Fiscal year 1926: Amounts specified in appropriation acts.....		432,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$12,828,380.26	\$158,366.59	\$12,986,746.85
Less collections.....	4,496,699.20		4,496,699.20
Net investment June 30, 1925.....	8,331,681.06	158,366.59	8,490,047.65

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$2,742.10	\$8,747,631.78
Supplemental construction.....	104,127.39	104,127.39
Total construction cost.....	106,869.49	
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 1,431.66	371,617.49
Operation and maintenance deficits and arrearages to be repaid with construction.....	1,919.39	1,945.71
		373,563.20
Less:		9,226,322.37
Contributed funds.....		101,113.89
Construction revenues.....	2,606.95	57,465.10
		158,578.99
Total to be repaid by water users.....	104,747.27	
Contracted repayments:		9,066,743.38
Water-right contracts (individuals).....	59,976.14	4,401,623.92
Contract—Imperial Irrigation district.....		1,600,000.00
Total.....	59,976.14	
		6,001,623.92

<sup>1</sup> Plus certain unexpended balances of 1925 appropriation.<sup>2</sup> Contra.

*Operation and maintenance account*

	Calendar 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$379,998.74	\$2,385,132.50	\$308,151.17	\$2,528,755.98
Operation and maintenance returns:				
Contracted.....	396,107.77	1,785,730.48	326,710.23	1,794,260.95
Penalties.....	16,419.60	48,732.53	10,489.44	55,508.08
Discounts (contra).....	6,193.53	20,039.85	8,390.34	27,849.73
Miscellaneous revenues.....	164,369.32	103,009.99	3,621.85	111,572.62
Subtotal.....	341,964.52	1,917,483.15	332,431.18	1,933,491.92
Other credits:				
Operation and maintenance deficits and arrears to be repaid with construc- tion.....	1,919.39	1,945.71	1,919.39	1,945.71
Total.....	343,883.91	1,919,378.86	334,350.57	1,935,437.63
Results:				
Excess.....			26,199.40	
Deficit.....	36,114.83	465,753.64		593,318.30

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$312,819.92	\$1,784,347.38	\$359,848.34	\$1,650,700.21	\$859.39	\$4,024.28	\$129,622.89
Contributed funds.....		101,113.89		101,113.89			
Total.....	312,819.92	1,885,461.27	359,848.34	1,751,814.10	859.39	4,024.28	129,622.89
Charges paid in advance.....			16,928.39	838.28		146.81	
Construction refunds.....				1,583.60			
Operation and maintenance:							
Water-right charges, project lands (62-812.39 acres).....	328,629.62	1,794,260.95	299,856.69	1,590,520.94	9,396.22	32,974.14	170,765.87
Penalties and interest.....	10,489.44	55,508.08	9,572.73	54,290.82	99.14	399.09	817.57
Charges paid in advance.....			1738.14	735.69		559.20	
Operation and maintenance refunds.....				248.91			
Miscellaneous:							
Rentals of irrigation water.....	2,026.71	446,327.44	1,664.58	441,863.87		292.01	4,171.56
Rentals grazing and farming lands.....	3,118.60	16,975.62	2,998.60	16,702.45			273.17
Construction forfeitures.....			374.24	3,554.18			
Construction penalties and interest.....	12,743.99	103,853.76	10,444.88	101,554.65			2,299.11
Other.....			31,076.77	532,991.71			2,182.55
Grand total collections.....			708,170.30	4,496,699.20			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 7.83 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1925, 9.25 per cent of total accruals.

## YUMA AUXILIARY PROJECT, ARIZONA

*Appropriations*

	Yuma auxiliary fund, without year	Reclamation fund, fiscal year 1925-26
Congressional authorizations.....	\$830, 273. 33	\$200, 000. 00
Less disbursements and liabilities outstanding.....	788, 429. 41	13, 340. 27
Unencumbered balance, June 30, 1925.....	41, 843. 92	186, 659. 73

*Voucher transactions*

	Reclama- tion fund	Yuma auxil- iary fund	Increase of compensa- tion (net)	Total
Disbursements and net transfers.....	\$7, 694. 74	\$788, 429. 41	\$15, 851. 45	\$811, 975. 60
Less collections.....		830, 273. 33		830, 273. 33
Net investment June 30, 1925.....	7, 694. 74	1 41, 843. 92	15, 851. 45	1 18, 297. 73

<sup>1</sup> Contra.*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$4, 416. 16	\$839, 306. 26
Operation and maintenance prior to public notice.....	1 20. 00	1 40. 00
Less: Construction revenues.....	53. 26	839, 266. 26
Total to be repaid by water users.....	4, 342. 90	838, 198. 03
Contracted repayments: Water-right contracts (individuals).....	1 158, 990. 41	952, 476. 33

<sup>1</sup> Contra.*Operation and maintenance*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$41, 519. 13	\$108, 144. 18	\$51, 331. 15	\$139, 979. 04
Operation and maintenance returns:				
Contracted.....	56, 128. 92	125, 878. 96	51, 828. 60	171, 551. 96
Penalties.....	85. 75	537. 74		537. 74
Discount (contra).....	1 3. 60	1, 106. 79		1, 106. 79
Miscellaneous revenues.....	75. 00	150. 00	507. 00	667. 00
Totals.....	56, 293. 17	125, 459. 91	52, 335. 60	171, 699. 91
Results: Excess.....	14, 774. 04	17, 315. 73	1, 004. 45	31, 680. 87

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges .....	\$150,926.00	\$734,790.00	\$24,424.25	\$550,525.56			\$234,264.44
Land sales .....	21,927.00	107,043.53	3,812.00	75,401.09			31,642.44
Total .....	172,853.00	891,833.53	28,236.25	625,926.65			265,906.88
Interest .....	501.68	35,977.14	501.68	35,977.14			
Forfeitures .....	13,650.91	24,085.66	13,650.91	24,085.66			
Refunds .....			1,159.25	1,328.35			
Operation and maintenance:							
Water-right charges .....	51,828.60	171,551.96	40,090.03	94,745.56		1,106.79	75,699.61
Interest .....		537.74		537.74			
Charges paid in advance			217.75	7.00			
Miscellaneous:							
Rentals of irrigation							
water .....	527.00	667.00	95.00	265.00			432.00
Other miscellaneous col-							
lections .....			7,713.79	47,400.23			1,664.85
Grand total collec-							
tions .....			34,756.66	830,273.33			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 29.9 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 44.1 per cent of total accruals.

**CALIFORNIA, ORLAND PROJECT**

The Orland project is located in Glenn and Tehama Counties, with reservoir in Colusa County. The average elevation above sea level is 250 feet; the mean seasonal rainfall, 18 inches; and the temperature range, 19° to 114° F. The soil is sandy and gravelly loam, silt loam, and clay loam. The principal products are alfalfa, milo, citrus and other fruits, nuts, and vegetables.

*Operation and settlement data, Orland project*

Item	1920	1921	1922	1923	1924
Acreage for which Bureau was prepared to supply water.....	20,533	20,657	20,665	20,665	20,660
Acreage irrigated.....	13,872	14,697	15,119	15,500	11,970
Miles of canal operated.....	138	146	146	146	121
Water stored (acre-feet).....	62,000	13,690	63,460	36,250	21,790
Water diverted (acre-feet).....	33,800	68,867	76,632	73,191	17,023
Water delivered to land (acre-feet).....	20,600	44,200	50,589	47,363	10,451
Per acre of land irrigated (acre-feet).....	1.49	3.01	3.34	3.06	0.88
Total number of farms on project.....	908	936	968	968	968
Population.....	2,200	2,250	2,275	2,300	2,100
Number of irrigated farms.....	644	663	693	703	673
Operated by owners or managers.....	592	589	568	569	562
Operated by tenants.....	52	74	125	124	111
Population.....	1,844	1,892	1,909	1,945	1,750
Number of towns.....	1	1	1	1	1
Population.....	1,700	1,700	1,700	1,700	1,700
Total population.....	3,900	3,950	3,975	4,000	3,800
Number of public schools.....	10	10	10	10	10
Number of churches.....	7	7	7	7	7
Number of banks.....	2	2	2	2	2
Total capital stock.....	\$171,000	\$171,000	\$171,000	\$171,000	\$171,000
Amount of deposits.....	\$1,020,000	\$965,000	\$965,000	\$1,107,000	\$1,041,000
Number of depositors.....	2,900	2,800	2,900	3,000	2,950

<sup>1</sup> Includes 320 acres of vested water rights and 46 acres of town and school sites.<sup>2</sup> Includes 320 acres of vested water rights and 162 acres of school and town sites.<sup>3</sup> Includes 320 acres of vested rights and 171 acres of school and town sites.

*Appropriations*

Fiscal year 1925:			
Congressional authorizations.....			\$30,625.04
Disbursements.....		\$28,470.12	
Liabilities outstanding.....		2,872.12	
			<u>\$1,342.84</u>
Unencumbered balance June 30, 1925.....			68,282.80
Fiscal year 1926: Amount specified in appropriation acts.....			84,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,826,082.28	\$31,826.28	\$1,557,857.54
Less collections.....	769,985.75		769,985.75
Net investment June 30, 1925.....	<u>756,046.51</u>	<u>\$1,826.28</u>	<u>757,871.79</u>

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$194.87	\$920,408.20
Supplemental construction.....	1,173.03	221,461.19
Total construction cost.....	<u>1,367.90</u>	<u>1,141,869.39</u>
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 148.50	<sup>1</sup> 11,878.49
Less: Construction revenue.....	986.16	15,574.72
Total to be repaid by water users.....	<u>233.24</u>	<u>1,114,411.18</u>
Contracted repayments: Water-right contracts (Individuals).....	<sup>1</sup> 357.50	<u>1,119,215.25</u>

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$28,365.45	\$262,924.20	\$29,737.79	\$279,856.89
Operation and maintenance returns:				
Contracted.....	33,276.46	278,982.19	33,276.44	278,982.17
Penalties.....	34.47	74.44	59.62	125.34
Discounts (contra.).....	875.30	12,982.75	917.00	13,025.94
Miscellaneous revenues.....	16.45	1,551.44	193.20	1,789.69
Total.....	<u>32,452.08</u>	<u>267,625.32</u>	<u>32,612.26</u>	<u>267,812.26</u>
Results:				
Excess.....	4,086.63	4,701.12	2,874.47	
Deficit.....				<u>12,044.63</u>

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$66,455.68	\$371,285.58	\$36,659.79	\$340,263.58	.....	.....	\$31,022.00
Charges paid in advance.....				5,385.16	.....	.....	
Operation and maintenance:							
Water-right charges, project lands (20,167.5 acres).....	33,276.44	278,982.17	25,775.49	259,189.39	\$917.00	\$13,025.94	6,766.84
Penalties and interest.....	59.62	125.34	59.62	125.34	.....	.....	
Operation and maintenance refunds.....			17.98	17.98	.....	.....	
Miscellaneous:							
Rentals of irrigation water.....	220.50	120,604.50	220.50	120,604.50	.....	.....	
Rentals grazing and farming lands.....		79.50		79.50	.....	.....	
Construction forfeitures.....			97.24	196.33	.....	.....	
Construction penalties and interest.....	931.51	968.93	931.51	968.93	.....	.....	
Other.....			2,218.90	43,155.04	.....	.....	
Grand total collections...			65,981.03	769,985.75			

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 8.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 2.4 per cent of total accruals.

**COLORADO, GRAND VALLEY PROJECT**

The Grand Valley project is located in Mesa County, Colo., on the main line of the Denver & Rio Grande Western Railroad. The average elevation of the irrigable area is 4,700 feet, the average annual rainfall is 8.3 inches, and the average range of temperature is from 99 to  $-7^{\circ}$  F. The soils consist of red mesa, sandy loam, and adobe. The principal crops are alfalfa, sugar beets, grain, corn, fruit, potatoes, and vegetables.

*Operation and settlement data, Grand Valley project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau is prepared to supply water.....	1 38,400	1 38,400	1 38,400	1 48,400	1 46,750
Acreage irrigated.....	1 19,484	1 20,590	1 20,672	1 23,770	1 25,250
Miles of canals operated.....	175	175	175	175	175
Water diverted, acre-feet.....	1 142,527	1 145,416	1 166,404	1 247,267	1 272,824
Water delivered to land, acre-feet.....	1 36,024	1 43,978	1 46,290	1 48,528	1 58,375
Per acre of land irrigated.....	1 3.07	1 3.57	1 3.74	1 3.77	1 4.34
Total number of farms on project <sup>1</sup> .....	825	825	825	825	825
Population.....	1,019	1,064	1,134	1,185	1,215
Number of irrigated farms.....	376	402	387	398	453
Operated by owners or managers.....	251	264	217	229	296
Operated by tenants.....	125	138	170	167	157
Population.....	1,019	1,064	1,134	1,185	1,215
Number of towns.....	6	6	6	6	6
Population <sup>2</sup> .....	11,415	11,246	11,246	11,246	11,246
Total population in towns and on farms <sup>3</sup> .....	12,434	12,310	12,380	12,431	12,461
Number of public schools <sup>4</sup> .....	23	23	24	24	24
Number of churches <sup>5</sup> .....	28	28	28	28	32
Number of banks <sup>6</sup> .....	7	7	7	6	6
Total capital stock <sup>7</sup> .....	\$465,000	\$465,000	\$468,700	\$452,300	\$445,000
Amount of deposits <sup>8</sup> .....	\$3,269,780	\$3,621,420	\$3,520,500	\$3,237,000	\$3,927,200
Total number of depositors <sup>9</sup> .....	10,150	10,975	8,825	9,850	12,600

<sup>1</sup> Includes data for Palisade and Mesa County irrigation districts.

<sup>2</sup> Includes data for Orchard Mesa, Palisade, and Mesa County irrigation districts; project proper, 30,000 acres to which bureau could supply water; 12,870 acres irrigated.

<sup>3</sup> Orchard Mesa, Palisade, and Mesa County districts included; project proper, 30,000 acres irrigable; 13,460 acres irrigated.

<sup>4</sup> Project lands only.

<sup>5</sup> Estimated.

<sup>6</sup> These items include areas adjacent to project.



*Appropriations*

Fiscal year 1925:			
Congressional authorizations.....			\$538,515.20
Disbursements.....		\$321,854.41	
Liabilities outstanding.....		55,578.83	
			277,423.24
Unencumbered balance June 30, 1925.....			161,082.06
Fiscal year 1926: Amount specified in appropriation acts.....			278,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$5,119,911.72	\$77,512.18	\$5,197,423.90
Less collections.....	443,451.06		443,451.06
Net investment June 30, 1925.....	4,676,460.66	77,512.18	4,753,972.84

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$380,634.82	\$4,633,156.24
Operation and maintenance prior to public notice (net).....	14,443.83	112,505.23
Less: Construction revenues.....	2,698.62	\$4,73,651.47
		51,643.70
Total to be repaid by water users.....	373,692.37	4,687,777.77
Contracted repayments: Contract, Orchard Mesa irrigation district.....		1,000,000.00

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Miscellaneous:							
Rentals of irrigation water.....	\$52,244.23	\$327,723.32	\$50,655.85	\$295,184.56	\$1,454.99	\$5,455.13	\$327,063.63
Rentals grazing and farming lands.....	65.00	344.00	77.00	294.00	7.50	7.50	42.50
Other.....			10,258.32	147,972.50			32.72
Grand total collections.....			60,991.17	443,451.06			

**COLORADO, UNCOMPAHGRE PROJECT**

The Uncompahgre project is in southwestern Colorado, in Montrose and Delta Counties, on the Denver & Rio Grande Western Railroad. The irrigation season extends generally from April 1 to October 31, 214 days, in all Government canals. The average elevation of the irrigable area is 5,500 feet above sea level; the average annual precipitation on the project for 23 years, 9.48 inches; and the average range of temperature, 10° to 95° F. The soils of the irrigable area are red sandy gravel, adobe, and clay loams. The principal products are alfalfa, grain, sugar beets, potatoes, onions, fruits, and other vegetables. The principal markets are Denver, Omaha, Kansas City, and the West for livestock; Denver, Missouri River points, and Texas for fruit, potatoes, and onions.

*Operation and settlement data, Umcompahgre project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	100,000	<sup>1</sup> 97,410	97,410	97,060	<sup>1</sup> 96,510
Acreage irrigated.....	64,180	63,780	64,730	64,320	<sup>1</sup> 63,350
Miles of canal operated.....	448	452	467	489	532
Water diverted (acre-feet).....	429,820	446,225	427,706	439,452	379,144
Water delivered to land (acre-feet).....	368,853	415,599	422,398	328,877	303,814
Per acre of land irrigated (acre-feet).....	5.70	6.52	6.52	5.11	4.89
Total number of farms on project.....	2,000	2,000	2,000	2,000	2,000
Population.....	6,018	6,166	6,149	6,097	5,822
Number of irrigated farms.....	1,688	1,639	1,624	1,694	1,599
Operated by owners or managers.....	1,077	941	944	962	911
Operated by tenants.....	511	696	680	732	688
Population.....	6,015	6,166	6,149	6,097	5,822
Number of towns.....	3	3	3	3	3
Population.....	7,450	7,450	7,450	7,450	7,400
Total population in towns and farms.....	13,465	13,616	13,599	13,547	13,222
Number of public schools.....	27	27	27	26	26
Number of churches.....	27	27	27	27	27
Number of banks.....	8	8	7	6	6
Total capital stock.....	\$621,763	\$618,250	\$550,100	\$505,136	\$505,136
Amount of deposits.....	\$4,925,150	\$3,219,773	\$2,930,700	\$3,232,626	\$3,301,367
Number of depositors.....	11,000	11,000	11,250	11,250	11,250

<sup>1</sup> Decrease due to reclassification.<sup>1</sup> Prospect proper, 95,200.<sup>1</sup> Project proper, 62,180.*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$186,368.38
Disbursements.....	\$133,197.94	
Liabilities outstanding.....	5,319.63	
		138,517.57
Unencumbered balance June 30, 1925.....		47,850.81
Fiscal year 1926: Amount specified in appropriation acts.....		163,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$3,296,668.26	\$103,089.22	\$3,399,757.48
Less collections.....	1,637,004.89		1,637,004.89
Net investment June 30, 1925.....	6,650,663.37	103,089.22	6,753,752.59

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$168.61	\$6,363,850.74
Value of works taken over.....	900.00	74,062.17
Total construction cost.....	1,068.61	6,437,912.91
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 3,013.35	301,713.15
Less construction revenues.....	<sup>1</sup> 1,306.64	
Total to be repaid by water users.....	<sup>1</sup> 638.10	6,709,900.82
Contracted repayments: Water-right contracts (individuals).....		6,713,584.50

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1924	To Dec. 31 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost .....	\$141,861.37	\$281,845.74	\$138,105.43	\$357,842.60
Operation and maintenance returns:				
Contracted .....	136,990.85	295,386.35	137,204.91	295,046.36
Penalties .....	494.45	494.45	2,116.94	2,296.19
Discounts (contra) .....	2,801.77	5,983.39	2,745.63	6,057.66
Miscellaneous revenues .....	3,209.15	4,049.46	3,490.38	6,761.23
Total .....	137,695.68	298,946.87	140,075.60	298,046.13
Results:				
Excess .....		12,101.13	1,970.17	
Deficit .....	3,396.69			59,796.47

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges .....	\$106,124.59	\$370,622.96	\$23,818.90	\$77,833.69	\$8,433.44	\$43,265.88	\$249,523.39
Charges paid in advance.....			1 48.50	63.16	1 6,590.80	34,241.12	
Operation and maintenance:							
Water-right charges, project lands (93,025 acres).....	137,204.91	295,046.36	69,196.11	152,119.47	7,175.18	12,803.75	130,123.14
Penalties and interest .....	2,116.94	2,296.19	492.24	617.15	144.83	199.17	1,479.87
Charges paid in advance.....			1 265.39	236.22	115.30	201.00	
Miscellaneous:							
Rentals of irrigation water.....	6,517.99	1,195,632.14	10,016.07	1,164,261.63	886.15	12,978.59	18,371.92
Rentals grazing and farming lands.....	45.00	242.45	45.00	242.45			
Construction penalties and interest.....	5,603.48	10,612.60	3,621.65	8,041.70	124.45	713.52	1,857.38
Other.....			2,376.43	233,569.42			1,657.15
Grand total collections.....			109,252.51	1,637,004.89			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 67.3 per cent of total accruals. Uncollected operations and maintenance charges as of June 30, 1925, 44.1 per cent of total accruals.

## IDAHO, BOISE PROJECT

The Boise project is located in the counties of Ada, Boise, Canyon, and Elmore, Idaho; and Malheur, Oreg. The length of the irrigation season is 184 days from April 5. The average elevation of the irrigable area is 2,500 feet above sea level. The rainfall at Boise for 61 years averaged 13.53 inches. The average highest recorded temperature for 26 years is 102° F., and the average lowest temperature for the same period is 1° F. The character of the soil is clayey loam, light sandy loam, and sandy loam. The principal products are alfalfa, wheat, oats, clover, potatoes, apples, prunes, and head lettuce. The principal markets are Boise, Nampa, Caldwell, and Meridian, Idaho; Portland, Oreg.; and eastern cities.

*Operation and settlement data, Boise project, Idaho*

Item	1920	1921	1922	1923	1924
Acreage to which bureau was prepared to furnish water.....	1 274, 379	1 282, 831	1 283, 411	1 283, 471	1 283, 580
Acreage irrigated.....	1 131, 760	1 153, 000	1 155, 000	1 155, 500	1 156, 000
Miles of canal operated.....	1, 000	1, 016	1, 056	1, 019	1, 019
Water diverted (acre-feet).....	853, 810	844, 195	748, 570	895, 705	444, 593
Water delivered to land per acre of land irrigated (acre-feet).....	3.00	3.67	3.46	3.70	1.77
Total number of farms on project.....	4, 000	4, 085	4, 998	5, 000	4, 900
Population.....	16, 000	16, 340	14, 700	14, 650	14, 000
Number of irrigated farms.....	3, 260	3, 300	3, 559	3, 600	3, 500
Operated by owners or managers.....	2, 417	2, 440	2, 896	2, 988	2, 153
Operated by tenants.....	843	860	663	612	1, 347
Population.....	11, 176	11, 550	14, 226	10, 800	10, 800
Number of towns.....	10	8	8	8	10
Population.....	36, 400	36, 170	36, 170	36, 270	36, 660
Total population in towns and on farms.....	52, 400	52, 510	50, 870	50, 920	50, 660
Number of public schools.....	24	28	28	28	48
Number of churches.....	56	56	56	58	58
Number of banks.....	17	16	16	14	13
Total capital stock.....	\$1, 850, 000	\$2, 741, 000	\$2, 741, 000	\$1, 750, 000	\$1, 390, 000
Amount of deposits.....	\$20, 600, 000	\$16, 326, 000	\$16, 707, 000	\$15, 295, 000	\$17, 639, 000
Number of depositors.....	32, 000	30, 000	30, 000	30, 000	31, 000

<sup>1</sup> Including partial service to vested water-right land under Warren Act; project proper, 144,200 acres in 1924.

<sup>2</sup> Acreage served with full water supply.

<sup>3</sup> 112,630 acres covered by crop census, including some Warren Act land.

<sup>4</sup> Includes towns in and adjacent to the project.

<sup>5</sup> Includes schools in and adjacent to the project that use rural school busses.

<sup>6</sup> Estimated; some banks refuse to give number of depositors.

*Appropriations*

Fiscal year 1925:	
Congressional authorizations.....	\$1, 045, 344.62
Disbursements.....	\$546, 341.58
Liabilities outstanding.....	101, 408.49
	647, 750.07
Unencumbered balance June 30, 1925.....	397, 594.55
Fiscal year 1926: Amount specified in appropriation acts.....	550, 000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$17, 770, 915.78	\$50, 228.93	\$206, 859.95	\$18, 028, 004.66
Less collections.....	5, 245, 178.68			5, 245, 178.68
Net investment June 30, 1925.....	12, 525, 737.10	50, 228.93	206, 859.95	12, 782, 825.98

*Construction account*

	Fiscal year 1925	To June 30, 1925	
Cost of irrigation works:			
Original construction .....	\$202,495.11	\$13,885,723.08	
Value of works taken over .....		29,812.50	
Total construction cost .....	202,495.11	13,915,535.58	
Operation and maintenance prior to public notice (net) .....		422,192.62	
Operation and maintenance deficits and arrearages to be repaid with construction .....	9,698.31	9,698.31	
Less construction revenues .....	12,724.77		\$14,347,426.51
Total to be repaid by water users .....	190,468.65		207,305.80
Contracted repayments, water-right contracts:			
Individuals .....	11,266.07		14,140,130.71
Warren Act .....			
Irrigation districts .....	140.74		7,516,786.12
Total <sup>1</sup> .....	11,306.81		28,779.17
			6,921,614.61
			14,467,379.90

<sup>1</sup> Contra.*Operation and maintenance accounts*

## REGULAR

	Calendar year, 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost .....	\$165,269.07	\$1,903,115.95	\$186,031.39	\$2,013,457.39
Operation and maintenance returns:				
Contracted .....	170,302.72	1,913,615.26	166,899.67	1,921,217.53
Penalties .....	18,177.84	43,998.51	33,280.38	59,487.33
Discounts (contra) .....	1,843.29	44,886.34	1,220.44	45,815.85
Miscellaneous revenues .....	8,456.41	122,426.67	7,910.02	123,469.30
Subtotals .....	195,093.68	2,035,154.10	205,869.63	2,058,858.31
Other credits: Operation and maintenance arrearages to be repaid with construction .....			9,698.31	9,698.31
Total .....	195,093.68	2,035,154.10	215,567.94	2,068,556.62
Results: Excess .....	29,824.61	132,038.15	29,536.55	55,099.23

## DRAINAGE

Operation and maintenance cost .....	\$145,629.29	\$332,222.08	\$82,390.08	\$392,222.20
Operation and maintenance returns:				
Contracted .....	138,102.69	549,491.48	138,491.94	618,837.21
Penalties .....	14,137.95	25,339.80	7,343.41	31,880.77
Discounts (contra) .....	1,040.32	4,853.44	1,106.77	5,402.79
Total .....	151,200.32	569,777.84	144,726.58	645,314.19
Results: Excess .....	5,571.03	237,755.76	62,336.65	253,001.90

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year, 1925	To June 30, 1925	Fiscal year, 1925	To June 30, 1925	
Construction:							
Water-right charges	\$674, 171.96	\$3, 062, 724. 64	\$226, 621. 12	\$1, 834, 744. 00		\$25, 002. 00	\$1, 222, 888. 64
Charges paid in advance			1 749. 90	7, 059. 80			
Construction refunds				567. 77			
Operation and maintenance (regular):							
Water-right charges, project lands (96,776.08 acres)	95, 538. 06	1, 219, 000. 32	30, 911. 66	844, 001. 01	\$1, 024. 28	27, 685. 99	347, 913. 32
Warren Act (379.07 approximate acres)	1, 055. 50	4, 011. 44	726. 62	2, 850. 08	3. 34	3. 34	1, 158. 02
Irrigation districts (68,303.59 approximate acres)	70, 305. 51	697, 605. 77	19, 023. 61	566, 634. 69	192. 87	17, 626. 62	113, 344. 56
Total	166, 899. 07	1, 921, 217. 53	50, 661. 89	1, 413, 485. 78	1, 220. 44	45, 315. 85	462, 415. 90
Penalties and interest	32, 280. 38	59, 487. 33	2, 158. 31	29, 365. 26			30, 122. 07
Charges paid in advance			1. 19				
Operation and maintenance refunds				393. 79			
Operation and maintenance (drainage):							
Water-right charges, project lands (96,776.08 acres)	98, 119. 27	419, 619. 42	58, 586. 71	276, 137. 33	1, 604. 20	5, 048. 65	188, 433. 24
Rental lands (5,506.50 approximate acres)	5, 484. 13	19, 183. 36	3, 518. 32	11, 479. 13	104. 57	363. 94	7, 250. 29
Irrigation districts (68,303.59 approximate acres)	29, 888. 54	180, 024. 43	13, 715. 42	93, 862. 50			86, 161. 03
Total	133, 491. 94	618, 827. 21	75, 820. 45	381, 578. 96	1, 108. 77	5, 402. 79	231, 845. 46
Penalties and interest	7, 343. 41	31, 899. 77	7, 343. 41	31, 899. 77			
Operation and maintenance refunds				36. 08			
Charges paid in advance			1 10. 60				
Miscellaneous:							
Rentals of irrigation water	7, 910. 02	762, 268. 77	7, 271. 44	738, 279. 05		4, 720. 50	19, 204. 22
Rentals power and light	11, 000. 00	139, 169. 91		96, 424. 61	11, 000. 00	42, 745. 30	
Rentals grazing and farming lands	882. 80	21, 551. 00	281. 50	20, 861. 00			690. 00
Construction penalties and interest	69, 427. 66	114, 357. 41	17, 947. 37	62, 877. 12			51, 480. 29
Other			9, 515. 03	627, 615. 69			9, 746. 15
Grand total collections			396, 860. 84	5, 245, 178. 68			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 39.7 per cent of total accruals. Uncollected regular operation and maintenance charges as of June 30, 1925, 24.1 per cent of total accruals. Uncollected operation and maintenance (drainage) charges as of June 30, 1925, 37.5 per cent of total accruals

## IDAHO, KING HILL PROJECT

The King Hill project is located in the counties of Elmore, Twin Falls, Owyhee, and Gooding. The average elevation above sea level is 2,750 feet. During the past 12 years the average annual rainfall was 8.59 inches, the average maximum temperature 107°, and the average minimum temperature 4° F. The soil ranges from light to heavy sandy loam with some heavy clay. With an irrigation season of 193 days, the project produces principally alfalfa, alfalfa seed, potatoes, grains, fruits in favorable seasons, and stock.

*Operation and settlement data, King Hill project*

Item	1920	1921	1922	1923	1924
Acreage for which the bureau was prepared to supply water.....	11,340	13,648	13,648	16,890	16,890
Acreage irrigated.....	4,780	5,908	6,440	7,017	6,290
Miles of canal operated.....	83.2	83.5	91.3	100.1	108.1
Water diverted (acre-feet).....	43,660	56,153	61,326	91,824	104,586
Water delivered to land (acre-feet).....	22,420	30,028	35,875	41,933	52,984
Per acre of land irrigated (acre-feet).....	4.69	5.08	5.57	5.97	8.65
Total number of farms on project.....	225	260	260	260	253
Population.....	424	557	569	598	656
Total irrigated farms.....	125	160	175	184	186
Operated by owners or managers.....	110	141	131	124	117
Operated by tenants.....	15	19	44	60	71
Number of towns.....	4	4	4	4	4
Population.....	1,572	1,685	2,062	1,525	1,816
Total population of towns and farms.....	1,996	2,242	2,651	2,123	2,472
Number of public schools.....	5	6	6	6	6
Number of churches.....	5	5	5	5	5
Number of banks.....	2	2	1	1	1
Total capital stock.....	\$20,000	\$30,000	\$20,000	\$20,000	\$20,000
Amount of deposits.....	\$418,548	\$319,086	\$276,000	\$290,000	\$296,315
Number of depositors.....	1,080	824	800	1,000	950

1 19 farm owners farming rented lands in connection with their own farms.

*Appropriations*

Fiscal year 1925:	
Congressional authorizations.....	\$30,134.61
Disbursements.....	\$41,242.49
Liabilities outstanding.....	2,417.59
	43,660.00
Unencumbered balance, June 30, 1925.....	16,467.53
Fiscal year 1926: Amount specified in appropriation acts.....	25,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,982,086.74	\$108,478.48	\$2,090,565.22
Less collections.....	127,823.26		127,823.26
Net investment, June 30, 1925.....	1,854,263.48	108,478.48	1,962,741.96

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$12, 718. 66	\$1, 904, 898. 80
Operation and maintenance prior to public notice (net).....	18, 533. 43	
Less:		
Contributed funds.....	8, 025. 66	8, 025. 66
Construction revenues.....	8, 086. 51	18, 002. 41
		26, 028. 07
Total to be repaid by water users.....	18, 935. 94	1, 878, 870. 73
Contracted repayments: Contract, King Hill irrigation district.....		2, 000, 000. 00

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$29, 348. 61	\$115, 012. 05	\$34, 512. 59	\$123, 923. 64
Operation and maintenance returns:				
Contracted.....	33, 784. 21	123, 672. 20	30, 606. 97	124, 951. 23
Discounts (contra).....		1, 519. 05		1, 519. 05
Total.....	33, 784. 21	122, 153. 15	30, 606. 97	123, 432. 18
Results:				
Excess.....	4, 435. 60	7, 141. 10		
Deficit.....			3, 905. 62	10, 491. 46

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$40,000.00	\$40,000.00					\$40,000.00
Contributed funds.....			\$8,025.66	\$8,025.66			
Operation and maintenance: King Hill Irrigation district (16,867.81 approximate acres).....	124,951.23	124,951.23	59,032.07	59,032.07	\$1,519.06	\$1,519.06	64,400.11
Miscellaneous:							
Rentals of irrigation water.....	88,368.94		50,515.83				
Penalties and interest.....	476.99	476.99	476.99	476.99			
Other.....			2,492.44	60,288.64			67.80
Grand total collections.....			14,536.45	127,833.26			

<sup>1</sup> Part transferred from water rentals. Actual accruals for year, \$30,606.97; actual collections, \$4,069.97 no other credits during year.<sup>2</sup> Contra.<sup>3</sup> Transferred to operation and maintenance.<sup>4</sup> Part transferred from water rentals. Actual accruals and collections for year, \$243.28.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 100 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 51.5 per cent of total accruals.



## IDAHO, MINIDOKA PROJECT

The Minidoka project is located in Minidoka and Cassia Counties, Idaho. Jackson Lake Reservoir is in Lincoln County, Wyo. The irrigation season is from April 1 to October 15 (198 days); average rainfall for 20 years, 11.9 inches; average of maximum and minimum temperatures for the past 20 years, 99.4° and -14.2° F. The principal products are alfalfa, wheat, oats, barley, clover seed, sugar beets, potatoes, and livestock.

*Operation and settlement data, Minidoka project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	121,557	121,557	121,562	121,570	121,570
Acreage irrigated.....	107,660	107,280	105,680	104,470	99,900
Miles of canal operated.....	634.60	634.60	634.60	634.60	634.60
Water diverted (acre-feet).....	734,428	697,815	711,050	708,889	653,320
Water delivered to land (acre-feet).....	383,766	99,363	107,673	112,380	107,653
Per acre of land irrigated (acre-feet).....	3.6	12.13	12.38	12.49	12.48
Total number of farms on project.....	2,420	2,454	2,451	2,453	2,453
Population.....	9,250	8,848	8,301	7,571	7,197
Number of irrigated farms.....	2,420	2,454	2,451	2,382	2,388
Operated by owners.....	1,883	1,987	1,988	1,758	1,278
Operated by tenants.....	557	467	583	624	1,010
Population.....	9,250	8,848	8,301	7,571	7,197
Number of towns.....	6	6	6	6	6
Population.....	9,000	8,445	8,170	7,070	6,920
Total population, towns and farms.....	18,250	17,293	16,471	14,641	14,117
Number of public schools.....	26	22	22	22	23
Number of churches.....	29	29	29	29	30
Number of banks.....	10	6	5	4	5
Total capital stock.....	\$345,000	\$190,000	\$180,000	\$210,000	\$200,000
Amount of deposits.....	\$3,860,744	\$1,140,000	\$1,100,000	\$1,250,000	\$1,400,000
Number of depositors.....	12,725	5,900	5,000	6,000	4,000

<sup>1</sup> South side pumping division only; data from gravity division not available.

<sup>2</sup> Partially estimated.

<sup>3</sup> Exclusive of banks that failed.

*Appropriations*

Fiscal year 1925:	
Congressional authorizations.....	\$510,213.06
Disbursements.....	\$154,548.58
Liabilities outstanding.....	23,708.37
	178,256.95
Unencumbered balance June 30, 1925.....	331,956.10
Fiscal year 1926: Amount specified in appropriation acts.....	170,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$3,851,924.46	\$15,550.90	\$119,746.94	\$3,987,222.30
Less collections.....	5,608,707.19			5,608,707.19
Net investment, June 30, 1925.....	3,243,227.27	15,550.90	119,746.94	3,380,525.11

### Construction account

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$22,966.57	\$5,646,253.53
Supplemental construction.....		749,429.74
Value of works taken over.....		211,782.66
Total construction cost.....	22,966.57	\$6,607,465.93
Operation and maintenance prior to public notice (net).....	1,415.39	155,047.30
Operation and maintenance deficits and arrearages to be repaid with construction.....	8,816.26	20,630.12
		6,783,143.35
Less:		
Contributed funds.....		799,250.96
Construction revenues.....	70,477.67	632,038.21
		1,431,289.17
Total to be repaid by water users.....	1,39,610.23	5,351,854.18
Contracted repayments; water-right contracts:		
Individuals.....	2,401.77	5,607,508.90
Warren Act.....		429,412.50
Total.....	2,401.77	6,036,921.40

**1 Contra.**

### Operation and maintenance account

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$117,887.42	\$1,663,569.10	\$118,290.32	\$1,721,468.98
Operation and maintenance returns:				
Contracted.....	117,432.07	1,619,416.30	98,754.70	1,639,073.45
Penalties.....	2,590.24	27,354.67	702.57	27,789.29
Discounts (contra).....	958.89	20,179.49	1,278.96	20,566.49
Miscellaneous revenues.....	160.26	98,697.31	190.26	98,697.31
Subtotal.....	119,233.68	1,725,288.79	98,347.57	1,744,063.56
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		12,313.86	8,316.26	20,630.12
Total.....	119,233.68	1,737,602.65	106,663.83	1,765,693.68
Results:				
Excess.....	1,346.26	74,083.55		44,125.30
Deficit.....			11,628.49	

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June, 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$329,554.92	\$2,712,714.76	\$125,496.64	\$1,971,727.31	\$11.07	\$154,434.31	\$586,553.14
Contributed funds.....		799,250.96		799,250.96			
Total.....	329,554.92	3,511,965.72	125,496.64	2,770,978.27	11.07	154,434.31	586,553.14
Charges paid in advance.....			12.68	2,054.03			
Construction refunds.....				3,163.72			
Operation and maintenance:							
Water-right charges, project lands (48,095.95 acres).....	178,257.19	953,171.40	35,761.76	699,211.05	1,278.96	19,821.69	234,138.66
Warren Act lands, (626,840 acres).....	15,960.00	146,134.13	13,269.64	143,432.43	2,697.48	2,697.48	4.23
Irrigation districts, (71,652.42 acres).....	22,515.64	520,012.32	12,637.83	458,762.57		51,871.94	9,877.81
Total.....	116,732.83	1,619,317.85	61,669.23	1,301,406.05	3,976.44	73,891.11	244,020.69
Penalties and interest.....	702.57	27,759.29	702.57	27,655.68		103.61	
Charges paid in advance.....			146.03	1,665.25			
Operation and maintenance refunds.....				8,699.21			
Miscellaneous:							
Rentals of irrigation water.....	584.65	272,607.98	716.32	299,373.75		3,294.23	
Rentals power and light.....	108,243.87	907,290.66	105,489.47	876,309.74	2,455.74	7,274.16	23,706.76
Rentals, grazing and farming lands.....	766.69	35,138.85	826.06	31,033.99			4,104.86
Construction forfeitures.....			301.95	9,647.98			
Construction penalties and interest.....	4,055.29	66,518.78	4,055.29	66,518.78			
Other.....			20,362.31	238,200.74			93.60
Grand total collections.....			319,571.13	5,606,707.19			

<sup>1</sup> Contra.<sup>2</sup> Actual accruals for the year..... \$25,890.40

Net relief deductions..... 7,628.21

Net accruals..... 78,257.19

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 16.7 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1925, 15 per cent of total accruals.

## AMERICAN FALLS RESERVOIR

*Appropriations*

<b>Fiscal year 1925:</b>		
Congressional authorizations.....		\$3,275,300.63
Disbursements.....	\$1,872,669.86	
Liabilities outstanding.....	443,219.17	
		1,815,889.02
Unencumbered balance, June 30, 1925.....		1,459,411.61
<b>Fiscal year 1926: Amount specified in appropriation acts.....</b>		<b>627,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$3,824,496.98	\$4,495.80	\$3,828,992.78
Less collections.....	2,723,657.02		2,723,657.02
Net investment, June 30, 1925.....	1,100,839.96	4,495.80	1,105,335.76

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$1,662,630.45	\$3,777,462.02
Less construction revenues.....	<sup>1</sup> 11,088.17	<sup>1</sup> 191,314.08
Total to be repaid by water users.....	1,673,668.62	3,968,776.05
Contracted repayments: Water-right contracts (Warren Act).....	<sup>1</sup> 1,315,144.00	3,347,638.00

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected		Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		
			Fiscal year 1925	To June 30, 1925	
Construction:					
Water-right charges.....	\$2,005,684.25	\$2,089,291.25	\$1,536,620.91	\$1,570,227.91	\$469,063.34
Charges paid in advance.....			527,128.82	902,128.82	
Miscellaneous:					
Construction forfeitures.....	12,782.00	12,782.00	12,782.00	12,782.00	
Construction penalties and interest.....	105,574.90	105,574.90	71,609.69	71,609.69	33,965.21
Other.....			64,681.94	166,908.60	5,349.87
Grand total collections.....			2,212,823.36	2,723,657.02	

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 23 per cent of total accruals.

## MONTANA, HUNTLEY PROJECT

The Huntley project is located in the south central part of Montana, Yellowstone County. The soils consist of heavy clays and light sandy loams, lying at an average elevation of about 3,000 feet above sea level. The average annual rainfall is 12 to 13 inches.

## Operation and settlement data, Huntley project

Item	1920	1921	1922	1923	1924
Acres for which bureau was prepared to deliver water.....	32,085	31,964	32,000	32,000	32,560
Acres irrigated.....	20,020	18,800	19,523	18,780	19,680
Miles of canal operated.....	229	229	229	229	229
Water diverted (acre-feet).....	70,079	70,186	72,245	72,893	72,886
Water delivered to land (acre-feet).....	24,280	26,814	18,768	20,298	24,717
Per acre of land irrigated (acre-feet).....	1.21	1.42	0.96	1.01	1.26
Total number of farms on project.....	691	691	690	696	617
Number of irrigated farms.....	603	578	590	547	557
Operated by owners or managers.....	330	377	387	269	215
Operated by tenants.....	283	201	203	278	342
Population.....	1,883	1,861	1,682	1,015	1,522
Number of towns.....	8	8	8	8	8
Population.....	664	673	673	530	530
Total populations in towns and on farms.....	2,547	2,534	2,355	1,545	2,352
Number of public schools.....	8	8	8	8	8
Number of churches.....	6	7	7	9	9
Number of banks.....	4	4	2	2	2
Total capital stock.....	\$95,000	\$95,000	\$50,000	\$50,000	\$50,000
Amount of deposits.....	\$588,362	\$402,282	\$155,000	\$155,000	\$192,180
Number of depositors.....	1,711	1,475	810	800	780

## Appropriations

Fiscal year 1925:		
Congressional authorizations.....		\$142,737.66
Disbursements.....		\$27,035.79
Liabilities outstanding.....		2,904.31
		28,940.10
Unencumbered balance June 30, 1925.....		112,797.56
Fiscal year 1926: Amount specified in appropriation acts.....		115,000.00

## Voucher transactions

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,451,990.05	\$31,698.25	\$2,483,688.30
Less collections.....	890,586.10		890,586.10
Net investment June 30, 1925.....	1,571,403.95	31,698.25	1,603,102.20

## Construction account

	Fiscal year 1925	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$84.21	\$1,125,086.67
Supplemental construction.....		573,736.05
Total construction cost.....	84.21	1,498,766.72
Operation and maintenance prior to public notice (net).....	1,188.31	1,800.90
Operation and maintenance deficits and arrearages to be repaid with construction.....	9,766.26	10,980.90
		\$1,508,987.72
Less:		
Contributed funds.....		717.64
Construction revenues.....	227.98	10,500.46
		17,218.10
Total to be repaid by water users.....	9,434.18	1,491,719.62
Contracted repayments: Water-right contracts (individuals).....	26,968.56	1,340,448.71

<sup>1</sup> Contra.

## Operation and maintenance account

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$36,065.14	\$911,501.99	\$36,300.45	\$927,319.18
Operation and maintenance returns:				
Contracted.....	26,386.06	491,029.45	26,019.59	490,325.04
Penalties.....	2,384.02	10,917.85	1,781.91	11,994.26
Discounts (contra).....	1,087.38	8,707.67	979.15	8,737.94
Miscellaneous revenues.....	436.70	8,929.56	444.06	9,450.27
Subtotals.....	27,069.37	502,168.99	27,266.41	503,081.63
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	9,766.26	10,980.90	9,766.26	10,980.90
Total.....	36,835.63	513,149.89	37,032.67	514,012.53
Results:				
Excess.....	800.49		732.22	
Deficit.....		398,352.10		413,306.65

## Status of current accounts receivable as of June 30, 1925

	Due		Collected				Uncol- lected, June 30 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$31,377.69	\$448,307.90	\$18,580.82	\$395,247.54		\$502.21	\$52,568.15
Contributed funds.....		717.64		717.64			
Total.....	31,377.69	449,025.54	18,580.82	395,965.18		502.21	52,568.15
Charges paid in advance.....			1217.10	336.39			
Construction refunds.....				969.78			
Operation and maintenance:							
Water-right charges, project lands (28,184.94 acres).....	35,785.85	490,325.04	30,572.67	382,384.18	\$979.15	9,481.13	98,459.73
Penalties and interest.....	1,781.91	11,994.26	1,781.91	11,818.49		175.77	
Charges paid in advance.....			781.22	802.49			
Operation and maintenance refunds.....				96.97			
Miscellaneous:							
Rentals of irrigation water..	540.72	7,777.45	606.96	7,377.59			399.86
Rentals, grazing and farming lands.....	963.56	13,627.78	902.93	13,146.06			481.72
Construction forfeitures.....			813.96	10,174.85			
Construction penalties and interest.....	1,366.58	5,508.73	1,366.58	5,508.73			
Other.....			486.99	52,006.42			55.30
Grand total collections.....			55,676.63	880,586.10			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 11.7 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 20.1 per cent of total accruals.

## MONTANA, MILK RIVER PROJECT

The Milk River project is located on the Great Northern Railway in north-eastern Montana, about 50 miles south of the Canadian boundary, and extending from the mouth of the Milk River (which is about 120 miles west of the North Dakota line) westward for about 150 miles to and beyond Chinook. The average elevation is about 2,200 feet; the soil grades from loam through finer textured loam or clay to a soil known locally as gumbo. The average annual rainfall is about 13.24 inches; the ordinary maximum summer and minimum winter temperatures are about 100° and -40° F., respectively.

## Operation and settlement data, Milk River project

Item	1920	1921	1922	1923	1924
Acreage for which bureau is prepared to supply water:					
Malta and Glasgow divisions.....	68,600	68,373	66,500	64,800	64,800
Chinook division.....	25,300	27,727	30,000	32,500	43,000
Acreage irrigated.....	24,330	42,400	46,370	41,900	40,500
Miles of canal operated, exclusive of Chinook division.....	361	276	284	282	312
Water diverted (acre-feet):					
For Malta and Glasgow divisions.....	80,800	84,444	75,177	67,200	80,000
For Chinook division.....	26,900	33,335	27,655	34,000	43,000
Water delivered to land, exclusive of Chinook division (acre-feet).....	10,460	6,190	6,068	6,875	7,800
Per acre of land irrigated exclusive of Chinook division (acre-feet).....	0.58	0.54	0.51	0.50	0.61
Total number of farms on project.....	466	364	298	680	667
Population.....	867	816	1,067	1,539	1,961
Number of irrigated farms.....	230	178	209	211	171
Operated by owners or managers.....	208	134	130	146	92
Operated by tenants.....	22	44	79	65	79
Population.....	763	484	651	806	743
Number of towns.....	15	15	15	15	15
Population.....	7,796	7,170	7,100	7,675	7,025
Total population on farms and towns.....	8,668	7,986	8,157	9,514	8,993
Number of public schools.....	38	38	38	35	24
Number of churches.....	25	25	25	30	35
Number of banks.....	25	24	23	20	17
Total capital stock.....	\$765,000	\$825,000	\$843,000	\$700,500	\$675,000
Amount of deposits.....	\$4,500,000	\$3,563,000	\$4,350,000	\$3,726,000	\$5,038,000
Number of depositors.....	14,000	12,500	12,000	9,900	10,300

<sup>1</sup> Reduction due to better data on irrigable area.

<sup>2</sup> Includes irrigated area in the Chinook division and land in the Malta and Glasgow divisions irrigated wholly or in part from flood-water systems; project proper, 14,000 acres.

<sup>3</sup> Exclusive of Chinook division.

<sup>4</sup> Includes Chinook division.

<sup>5</sup> Deposits received from large area not in project.

## Appropriations

Fiscal year 1925:	
Congressional authorizations.....	\$323,826.76
Disbursements.....	\$63,583.55
Liabilities outstanding.....	142,308.68
	205,887.23
Unencumbered balance, June 30, 1925.....	117,938.53
Fiscal year 1926: Amount specified in appropriation acts.....	76,000.00

## Voucher transactions

	Reclamation fund	Judgments of court of claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$7,310,541.52	\$2,674.64	\$98,095.17	\$7,411,311.33
Less collections.....	415,191.93			415,191.93
Net investment, June 30, 1925.....	6,895,349.59	2,674.64	98,095.17	6,996,119.40

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$102,143.25	\$6,680,760.99
Operation and maintenance prior to public notice (net).....	34,707.42	423,680.59
Less: Construction revenues.....	1,579.17	63,220.88
Total to be repaid by water users.....	135,271.70	7,041,220.70

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Charges paid in advance.....		\$1,114.00		\$1,114.00			
Miscellaneous:							
Rentals of irrigation water.....	\$18,026.23	\$210,085.89	\$19,212.72	\$191,374.35	\$159.10	\$1,174.78	\$17,536.76
Rentals, grazing and farming lands.....	3,813.89	34,728.23	3,813.89	34,304.58		38.88	384.77
Other.....			6,890.22	188,399.00			12.26
Grand total collections.....			29,916.83	415,191.93			

**MONTANA, SUN RIVER PROJECT**

The Sun River project is located in Cascade, Chouteau, Lewis and Clark, and Teton Counties, lying to the north and west of Great Falls, Mont. The average elevation of the irrigable area is about 3,700 feet above sea level; the soil is loam, clay, and alluvium. The average annual rainfall is 10.9 inches; the average annual temperatures are: Maximum, 96° F.; minimum, -33° F.; mean, 44° F. The length of the irrigation season is from May 1 to October 10 (163 days); the principal crops are hay, grain, vegetables, livestock, and dairy products. The principal markets are Great Falls, St. Paul, Minneapolis, Chicago, and Seattle.

*Operation and settlement data, Fort Shaw and Greenfields divisions, Sun River project*

Item	1919	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	40,067	40,067	40,067	42,465	42,470	1 57,100
Acreage irrigated.....	11,496	14,870	21,750	20,537	9,090	21,630
Miles of canal operated.....	244	250	267	267	267	286
Water diverted (acre-feet).....	42,863	75,595	88,258	64,683	44,709	80,089
Water delivered to land (acre-feet).....	24,080	21,653	30,300	24,200	13,208	31,145
Per acre of land irrigated (acre-feet).....	1.9	1.47	1.39	1.17	1.31	1.44
Total number of farms on project.....	212	500	500	500	500	763
Population.....	542	1,000	1,000	1,000	1,000	1,112
Number of irrigated farms.....	199	354	373	388	394	441
Operated by owners or managers.....	151	264	285	273	200	266
Operated by tenants.....	48	90	88	115	94	175
Population.....	542	961	949	978	817	1,069
Number of towns.....	8	8	4	4	4	4
Population.....	155	685	378	401	354	397
Total population in towns and on farms.....	697	1,685	1,378	1,401	1,354	1,509
Number of public schools.....	4	17	17	17	17	17
Number of churches.....	4	11	11	11	11	11
Number of banks.....	1	15	13	13	13	13
Total capital stock.....	\$20,000	\$110,000	\$65,000	\$71,500	\$65,000	\$66,400
Amount of deposits.....	\$110,000	\$391,121	\$150,000	\$168,000	\$212,000	\$147,000
Number of depositors.....	400	1,278	780	740	650	585

<sup>1</sup> Increase due to bringing under irrigation of part 2, Greenfields division.

<sup>2</sup> Applies to whole project rather than to the two divisions named.



*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$172,457.00
Disbursements.....	\$81,985.43	
Liabilities outstanding.....	5,552.10	
		87,537.53
Unencumbered balance June 30, 1925.....		84,920.07
Fiscal year 1926: Amount specified in appropriation acts.....		611,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,858,014.02	\$1,585.35	\$80,158.27	\$4,939,757.64
Less collections.....	509,702.94			509,702.94
Net investment June 30, 1925.....	4,348,311.08	1,585.35	80,158.27	4,429,054.70

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$48,756.69	\$4,288,769.78
Operation and maintenance prior to public notice (net).....	16,538.95	131,313.56
Operation and maintenance deficits and arrearages to be repaid with construction.....	13,855.09	16,378.99
		\$4,536,457.33
Less:		
Contributed funds.....		274.69
Construction revenues.....	1504.63	30,074.93
		30,349.62
Total to be repaid by water users.....	70,655.36	4,497,107.71
Contracted repayments: Water-right contracts (Individuals).....	12,472.09	422,423.13

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$9,770.22	\$218,120.67	\$10,883.99	\$225,612.66
Operation and maintenance returns:				
Contracted.....	<sup>1</sup> 3,019.80	170,418.86	<sup>1</sup> 2,287.40	170,414.46
Penalties.....	905.69	3,498.23	2,455.19	5,433.11
Discounts (contra).....	184.91	3,192.34	188.94	3,217.70
Miscellaneous revenues.....	165.51	2,479.34	187.91	2,504.62
Subtotals.....	<sup>1</sup> 2,233.51	173,175.24	169.76	175,134.49
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	13,855.09	16,373.99	13,855.09	16,373.99
Total.....	11,621.58	189,549.23	14,024.85	191,568.45
Results:				
Excess.....	1,951.36		2,140.86	
Deficit.....		25,571.44		34,104.18

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$13,752.23	\$180,380.34	\$7,723.27	\$156,095.54	\$211.46	\$425.09	\$23,809.71
Contributed funds.....		274.69	115.92	158.77			115.92
Total.....	13,752.23	180,605.03	7,607.35	156,254.31	211.46	425.09	23,925.63
Charges paid in advance.....				29,176.06			
Construction refunds.....				3,034.70			
Operation and maintenance:							
Water-right charges, project lands (13,902.01 acres).....	11,567.69	170,414.46	7,909.57	139,786.60	247.96	3,493.51	27,124.35
Penalties and interest.....	2,456.19	5,433.11	2,128.97	5,040.93	59.42	124.38	267.80
Charges paid in advance.....				10.55			
Operation and maintenance refunds.....				126.91			
Miscellaneous:							
Rentals of irrigation water....	19,284.57	71,838.74	16,886.32	42,758.55	381.56	921.30	28,158.89
Rentals grazing and farming lands.....	3,304.27	37,429.10	3,519.58	34,333.68			3,085.42
Construction forfeitures.....			156.00	4,603.05			
Construction penalties and interest.....	2,246.87	4,289.80	2,066.15	4,109.08	12.21	12.21	168.51
Other.....			3,512.59	90,468.52			324.84
Grand total collections.....			43,786.53	509,702.94			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 13.2 per cent to total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 15.9 per cent of total accruals.

**MONTANA-NORTH DAKOTA, LOWER YELLOWSTONE PROJECT**

The Lower Yellowstone project is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. The length of the irrigation season depends upon the amount of precipitation in the spring. May 1 to October 10 (163 days) is the maximum period of water deliveries. The average elevation is 1,900 feet above sea level. The average number of days between the last killing frost in the spring and the first in the fall is 129. Since 1905 the average annual rainfall has been about 14.4 inches. The average of the highest temperature is 103° F., and the average lowest —35° F. Some alkali and gumbo are found in scattering low tracts, but the project as a whole has a deep sandy loam soil. The principal crops are alfalfa, grain, sugar beets, seed peas, potatoes, and corn. Billings, Mont., has been the market for sugar beets; Duluth and Minneapolis, Minn., for grain; Chicago and the South for potatoes.

*Operation and settlement data, Lower Yellowstone project*

Item	1920 <sup>1</sup>	1921 <sup>1</sup>	1922 <sup>1</sup>	1923 <sup>1</sup>	1924 <sup>1</sup>
Acres for which bureau was prepared to supply water.....	40,200	40,344	40,200	58,000	58,000
Acres irrigated.....	19,120	19,980	15,599	17,859	14,030
Miles of canal operated.....	187	174	213	268	226
Water diverted (acre-feet).....	47,375	64,972	49,280	89,390	81,070
Water delivered to land (acre-feet).....	16,633	25,733	18,411	22,459	17,757
Per acre of land irrigated (acre-feet).....	0.87	1.28	1.17	1.26	1.26
Total number of farms on project.....	543	572	575	686	686
Population.....	1,368	1,390	1,591	1,265	1,567
Number of irrigated farms.....	375	370	370	373	390
Irrigated farms operated by owners and managers.....	265	223	236	281	235
Irrigated farms operated by tenants.....	110	147	134	142	155
Number of towns.....	8	8	8	8	8
Population.....	2,850	2,805	2,805	2,415	2,560
Total population in towns and on farms.....	4,218	4,195	4,396	3,680	4,127
Number of public schools.....	12	12	13	13	16
Number of churches.....	15	15	15	15	15
Number of banks.....	10	9	7	4	6
Total capital stock.....	\$330,000	\$335,000	\$200,000	\$100,000	\$150,000
Amount of deposits.....	\$2,331,000	\$1,851,000	\$1,425,000	\$308,645	\$880,120
Number of depositors.....	6,500	4,726	4,475	1,850	2,778

<sup>1</sup> Project operated under contracts with irrigation districts.<sup>2</sup> District lands only.

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$95, 485. 35
Disbursements.....	\$62, 085. 49	
Liabilities outstanding.....	5, 904. 13	
		65, 899. 02
Unencumbered balance June 30, 1925.....		26, 596. 73
Fiscal year 1926: Amount specified in appropriation acts.....		180, 000. 00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4, 154, 433. 16	\$40, 119. 25	\$30, 908. 55	\$4, 225, 490. 96
Less collections.....	342, 504. 95			342, 504. 95
Net investment, June 30, 1925.....	3, 811, 928. 21	40, 119. 25	30, 908. 55	3, 882, 956. 01

*Construction account*

	Fiscal year, 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$909. 63	\$3, 089, 220. 39
Supplemental construction.....		77, 306. 38
Total construction cost.....	909. 63	3, 166, 526. 77
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 185. 32	<sup>1</sup> 554. 18
Operation and maintenance deficits and arrearages to be repaid with construction.....		522, 500. 05
Less construction revenue.....	1, 112. 34	
Total to be repaid by water users.....	<sup>1</sup> 328. 03	
Contracted repayments:		
Contracts, Lower Yellowstone Irrigation districts Nos. 1 and 2.....		3, 588, 421. 41
Water-right contracts (special).....		25, 880. 40
Total.....		3, 614, 301. 81

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year, 1924	To Dec. 31, 1924	Fiscal year, 1925	To June 30, 1925
Operation and maintenance cost.....	\$70, 132. 82	\$970, 835. 01	\$79, 391. 21	\$1, 013, 561. 80
Operation and maintenance returns:				
Contracted.....	69, 779. 74	323, 340. 30	69, 779. 74	323, 340. 30
Penalties.....		2. 59		2. 59
Discounts (contra).....		4. 63		4. 63
Miscellaneous revenue.....	353. 05	124, 998. 70	442. 43	125, 094. 20
Subtotals.....	70, 132. 82	448, 334. 96	70, 222. 17	448, 432. 46
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		522, 500. 05		522, 500. 05
Total.....	70, 132. 82	970, 835. 01	70, 222. 17	970, 932. 51
Results: Deficit.....			9, 169. 04	42, 629. 29

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Un- collected June 30, 1925
			Cash		Other credits		
	Fiscal year, 1925	To June 30, 1925	Fiscal year, 1925	To June 30, 1925	Fiscal year, 1925	To June 30, 1925	
Construction: Water-right charges	\$32, 635. 48	\$102, 057. 96	\$2, 987. 10	\$50, 863. 32	-----	-----	\$51, 194. 64
Operation and maintenance:							
Water-right charges, irrigation districts (58,248 acres)	47, 441. 34	291, 266. 59	1, 797. 24	52, 733. 72		\$4. 63	238, 528. 24
Penalties and interest	-----	2. 59	-----	2. 59	-----	-----	-----
Operation and maintenance refunds	-----	-----	-----	190. 56	-----	-----	-----
Miscellaneous:							
Rentals of irrigation water	262. 50	123, 850. 49	377. 47	122, 445. 73	-----	-----	1, 404. 76
Rentals farming and grazing lands	168. 68	3, 277. 63	273. 68	3, 277. 63	-----	-----	-----
Penalties and interest	13, 497. 11	38, 578. 71	13, 497. 11	38, 578. 71	-----	-----	-----
Other	-----	-----	1, 488. 68	74, 412. 69	-----	-----	653. 75
Grand total collections	-----	-----	20, 421. 28	342, 504. 95	-----	-----	-----

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 50.2 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 81.9 per cent of total accruals.

**NEBRASKA-WYOMING, NORTH PLATTE PROJECT**

The North Platte project is situated in western Nebraska and eastern Wyoming. The character of the soil varies from sandy loam on the major portion of the Interstate and Northport division to gumbo soil on portions of the Fort Laramie division. The principal products are alfalfa, cereals, corn, sugar beets, and potatoes; and the principal markets are Omaha, Nebr., Kansas City and St. Joseph, Mo., Denver, Colo., and central Wyoming. The length of the irrigation season is from April 1 to September 30 and the average rainfall amounts to 14.55 inches. The average temperature ranges between 99° maximum and -21° minimum, F.

*Operation and settlement data, Interstate division, North Platte project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water	\$ 129, 629	\$ 129, 666	113, 436	113, 490	114, 633
Acreage irrigated	\$ 97, 640	\$ 97, 400	87, 300	87, 404	85, 850
Miles of canal operated	807	809	805	802	810
Water delivered to land (acre-feet)	\$ 175, 153	\$ 186, 328	222, 509	155, 600	222, 720
Per acre of land irrigated (acre-feet)	\$ 1. 99	\$ 2. 14	2. 55	1. 78	2. 72
Total number of farms on project	1, 410	1, 450	1, 458	1, 458	1, 458
Population	5, 000	5, 700	5, 300	5, 300	5, 000
Number of irrigated farms	1, 300	1, 340	1, 340	1, 307	1, 325
Operated by owners or managers	800	710	720	690	625
Operated by tenants	500	630	620	617	700
Population	4, 746	5, 200	4, 782	4, 543	4, 350
Number of towns	9	9	9	6	6
Population	14, 382	14, 400	14, 400	12, 700	12, 700
Total population of towns and farms	19, 382	20, 100	19, 700	18, 000	17, 700
Number of public schools	40	40	40	50	50
Number of churches	40	40	40	37	37
Number of banks	21	26	26	13	12
Total capital stock	\$777, 500	\$787, 500	\$475, 000	\$505, 000	\$437, 500
Amount of deposits	\$7, 371, 100	\$6, 894, 400	\$3, 957, 700	\$4, 533, 000	\$5, 174, 400
Number of depositors	12, 000	11, 200	11, 650	13, 300	12, 300

<sup>1</sup> All data exclusive of North Platte Canal & Colonization Co. lands.

<sup>2</sup> Includes North Platte Canal & Colonization Co. lands.

<sup>3</sup> Exclusive of lands under North Platte Canal & Colonization Co. tract.

<sup>4</sup> Statistics for items below, for years previous to 1923, include some figures for Fort Laramie and Northport divisions.

*Operation and settlement data, Fort Laramie division, North Platte project*

Item	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	16,232	44,091	55,500	72,000
Acreage irrigated.....	12,150	20,302	32,441	30,080
Miles of canal operated.....	138	311	402	574
Water delivered to the land (acre-feet).....	22,665	43,680	45,806	96,737
Per acre of land irrigated (acre-feet).....	1.85	2.15	1.41	2.53
Total number of farms on project <sup>1</sup> .....	407	573	717	1,394
Population.....	1,500	1,066	1,700	4,800
Number of irrigated farms.....	190	330	564	776
Operated by owners or managers.....	106	244	350	267
Operated by tenants.....	85	76	305	563
Population.....	433	650	1,411	1,575
Number of towns.....	3	11	10	10
Population.....	2,900	5,000	4,800	4,860
Total population of towns and farms.....	4,400	6,066	6,500	9,300
Number of public schools.....	10	20	38	38
Number of churches.....	1	16	18	18
Number of banks.....	3	12	7	5
Total capital stock.....	<sup>2</sup> \$185,000	\$235,000	\$165,000	\$65,000
Amount of deposits.....	<sup>3</sup> \$1,089,800	\$1,794,900	\$1,413,000	\$1,000,116
Number of depositors.....	5,500	3,600	4,150	4,800

<sup>1</sup> Data for items below for years previous to 1923 estimated.<sup>2</sup> Lands on the Interstate and Fort Laramie divisions are tributary to 6 of the banks listed above.<sup>3</sup> \$155,000 of this amount is listed under similar caption on Interstate division.<sup>4</sup> \$919,600 of this amount is listed under similar caption on Interstate division.*Operation and settlement data, Northport division, North Platte project*

Item	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	4,712	16,350	16,380
Acreage irrigated.....	3,645	8,955	9,179
Miles of canal operated.....	-----	100	106
Water delivered to the land (acre-feet).....	11,722	16,321	30,535
Per acre of land irrigated (acre-feet).....	3.02	1.88	3.33
Total number of farms on project.....	223	323	263
Population.....	800	406	760
Number of irrigated farms.....	50	148	179
Operated by owners or managers.....	19	70	57
Operated by tenants.....	31	78	122
Population.....	250	225	415
Number of towns.....	2	2	2
Population.....	1,400	1,400	1,400
Total population of towns and farms.....	2,220	1,806	2,100
Number of public schools.....	7	6	14
Number of churches.....	5	5	5
Number of banks.....	2	2	2
Total capital stock.....	\$50,000	\$50,000	\$50,000
Amount of deposits.....	\$527,000	\$543,600	\$542,000
Number of depositors.....	2,000	2,480	2,300

*Appropriations*

Fiscal year 1923:		
Congressional authorizations.....		\$2,584,788.81
Disbursement.....	\$1,239,016.20	
Liabilities outstanding.....	126,800.00	
		1,365,816.20
Unencumbered balance June 30, 1925.....		1,218,942.83
Fiscal year 1926: Amount specified in appropriation acts.....		\$10,600.00

<sup>1</sup> Plus unexpended balance of \$300,000, appropriation for Guernsey Reservoir, fiscal year 1925.

*Voucher transactions*

	Reclamation fund	Judgments Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$19,654,412.22	\$26,425.67	\$353,839.98	\$20,034,677.87
Less collections.....	4,345,681.53			4,345,681.53
Net investment June 30, 1925.....	15,308,730.69	26,425.67	353,839.98	15,688,996.34

*Construction account*

	Fiscal year 1925	To June 30, 1925
<b>Cost of irrigation works:</b>		
Original construction.....	\$933,910.64	\$15,449,306.21
Supplemental construction.....	301,806.74	848,600.32
Value of works taken over.....		41,441.66
Total construction cost.....	1,235,717.38	16,384,948.18
Operation and maintenance prior to public notice (net).....	84,728.68	881,286.77
Operation and maintenance deficits and arrearages to be repaid with construction.....	68,069.13	150,483.08
	1,388,515.19	\$17,116,118.03
<b>Less:</b>		
Contributed funds.....	113,464.40	34,698.24
Construction revenues.....	11,834.33	115,468.53
		150,066.77
Total to be repaid by water users.....	1,390,145.26	16,966,051.26
<b>Contracted repayments, water-right contracts:</b>		
Individuals.....	75,333.63	7,911,990.41
Warren Act.....		1,074,013.50
Irrigation districts.....	5,250,000.00	6,300,000.00
Special.....	298.00	38,972.25
Total.....	5,325,035.63	15,324,986.16

1 Contra.

*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$206,966.32	\$2,120,374.49	\$311,046.23	\$2,322,196.51
<b>Operation and maintenance returns:</b>				
Contracted.....	149,292.47	2,085,970.82	218,475.66	2,196,206.15
Penalties.....	680.96	26,841.91	204.67	26,967.37
Discounts (contra).....	1,648.02	34,039.28	1,762.73	34,324.56
Miscellaneous revenues.....	1,968.48	23,708.84	1,680.80	24,891.64
Subtotals.....	150,302.89	2,102,477.20	218,568.40	2,213,680.00
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	68,069.13	150,483.08	68,069.13	150,483.08
Total.....	218,372.02	2,262,960.37	286,637.53	2,364,163.08
<b>Results:</b>				
Excess.....	12,465.70	132,585.88		41,967.17
Deficit.....			24,373.70	

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$348,647.71	\$3,126,680.69	\$55,222.27	\$1,787,860.52	\$738.41	\$35,607.27	\$1,303,112.90
Contributed funds.....	\$12,464.40	\$4,598.24	\$9,795.52	\$4,598.24			
Total.....	335,183.31	3,161,278.93	45,427.75	1,822,468.76	738.41	35,607.27	1,303,112.90
Charges paid in advance.....			\$ 6.60	529.00			
Construction re-funds.....			298.00	1,738.85			
Operation and maintenance:							
Water-right charges, project lands (109,012.07 acres).....	\$97,214.83	\$1,826,080.10	\$35,165.80	\$1,197,333.26	\$2,211.06	\$44,496.64	\$584,200.20
Warren Act lands (127,115 approximate acres).....	19,084.73	245,201.91	20,512.62	223,556.78	89.70	218.37	21,426.81
Funds advanced.....	79,303.50	79,303.50	79,303.50	79,303.50			
Irrigation districts (16,850 approximate acres).....	22,922.60	45,670.64	22,748.04	22,748.04			22,922.60
Total.....	218,475.66	2,196,206.15	157,729.96	1,522,941.53	2,300.76	44,715.01	628,549.61
Penalties and interest.....	204.67	26,907.37	81.87	26,179.63	123.30	727.74	
Charges paid in advance.....			142.87	171.10			
Operation and maintenance re-funds.....				488.96			
Miscellaneous:							
Rentals of irrigation water.....	65,359.88	287,943.25	71,330.96	279,927.40		10.00	8,005.85
Rentals power and light.....	39,066.29	152,923.87	31,848.33	129,106.76	5,646.41	19,902.00	3,913.11
Rentals grazing and farming lands.....	6,710.62	89,780.70	7,305.45	84,861.83			4,918.87
Construction forfeitures.....		6,102.75		6,102.75			
Construction penalties and interest.....	10,837.93	108,596.99	9,666.02	101,821.40	147.96	751.64	1,023.96
Other.....			90,552.33	369,242.56			16,104.13
Grand total collections.....			414,376.44	4,345,681.53			

	Construction	Operation and maintenance
<sup>1</sup> Actual accruals for the year.....	\$436,700.96	\$165,283.96
Deferred under the relief act of Feb. 28, 1923.....	88,062.27	68,069.13
Net accruals.....	348,637.71	97,214.83

<sup>1</sup> Contra.

NOTE.—Uncollected construction on water-right charges as of June 30, 1925, 41.7 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 29.7 per cent of total accruals.

## NEVADA, NEWLANDS PROJECT

The Newlands project is located on the Southern Pacific Railroad in Churchill, Storey, Lyon, and Washoe Counties, Nev. The average annual precipitation on the irrigable area, which is at an elevation of about 4,000 feet above sea level, is 4.87 inches. The principal crops are alfalfa, grain, potatoes, melons, honey, and dairy products.

*Operation and settlement data, Newlands project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	69,310	72,166	73,747	73,730	72,625
Acreage irrigated.....	45,610	46,160	44,963	44,890	44,280
Miles of canal operated.....	389	393	410	411	411
Water diverted (acre-feet).....	205,225	314,241	499,508	367,929	265,460
Water delivered to land (acre-feet).....	129,814	132,783	141,972	145,653	149,560
Per acre of land irrigated (acre-feet).....	2.85	2.87	3.15	3.24	3.33
Total number of farms on project.....	785	870	906	912	917
Population.....	2,523	2,652	2,450	2,737	2,668
Number of irrigated farms.....	742	788	778	788	763
Operated by owners or managers.....	677	708	681	681	670
Operated by tenants.....	65	80	97	107	92
Population.....	2,523	2,652	2,450	2,737	2,668
Number of towns.....	5	5	5	5	5
Population.....	2,830	2,800	2,800	2,800	2,300
Total population, towns, and on farms.....	5,353	5,152	4,950	5,237	4,968
Number of public schools.....	12	11	11	11	11
Number of churches.....	8	8	8	8	9
Number of banks.....	2	1	1	1	1
Capital stock.....	\$115,000	\$75,000	\$75,000	\$75,000	\$75,000
Amount of deposits.....	\$864,360	\$677,104	\$680,700	\$800,000	\$851,639
Number of depositors.....	2,500	2,000	1,700	1,600	1,700

*Appropriations*

<b>Fiscal year 1925:</b>	
Congressional authorizations.....	\$515,757.26
Disbursements.....	\$185,244.18
Liabilities outstanding.....	13,211.20
	201,455.88
Unencumbered balance June 30, 1925.....	314,301.88
<b>Fiscal year 1926:</b> Amount specified in appropriation acts.....	667,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$9,065,613.99	\$90,440.32	\$9,156,054.31
Less collections.....	1,929,711.85		1,929,711.85
Net investment June 30, 1925.....	7,135,902.14	90,440.32	7,226,342.46

*Construction account*

	Fiscal year 1925	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction.....	\$52,945.85	\$6,716,613.18
Supplemental construction.....		753,955.72
Value of works taken over.....		37,082.61
Total construction cost.....	52,945.85	7,507,651.51
Operation and maintenance prior to public notice (net).....	1,185.60	1,540.11
Operation and maintenance deficits and arrearages to be repaid with construction.....	2,134.43	4,157.86
Less: Construction revenues.....	3,370.07	
Total to be repaid by water users.....	51,594.61	7,334,762.96
<b>Contracted repayments:</b>		
Water-right contracts (individuals).....	123,628.09	1,841,027.44
Contract, Truckee-Carson irrigation district.....	75,611.32	698,308.80
Totals.....	148,116.77	2,540,336.24

1 Contra.



## Operation and maintenance account

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$187,337.13	\$1,285,224.83	\$145,527.03	\$1,331,907.83
Operation and maintenance returns:				
Contracted.....	183,170.94	1,194,706.08	157,040.19	1,168,364.21
Penalties.....	3,591.62	16,562.00	5,768.08	21,213.72
Discounts (contra).....	2,407.10	20,251.48	2,366.69	20,290.06
Miscellaneous revenues.....	480.90	19,348.87	4,850.90	23,976.87
Subtotals.....	184,836.36	1,210,365.47	165,292.48	1,193,294.74
Other credits: Operation and maintenance deficit and arrearages to be repaid with construction.....	2,184.43	4,157.36	2,184.43	4,157.36
Total.....	186,970.79	1,214,522.83	167,436.91	1,197,452.10
Results:				
Excess.....			18,899.88	
Deficit.....	366.34	70,702.00		134,455.23

## Status of current accounts receivable as of June 30, 1925

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal 1925	To June 31, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges	\$44,908.31	\$637,095.28	\$31,912.59	\$577,074.70	\$1,016.92	\$7,806.82	\$52,214.76
Charges paid in advance			3,521.98	4,909.05			
Construction refunds				384.55			
Operation and maintenance:							
Water-right charges, project lands (65,040 acres)	\$109,605.48	1,023,295.07	98,142.62	874,791.42	3,745.82	32,023.37	116,480.28
Penalties and interest	5,768.08	21,213.72	5,698.43	20,369.25	138.91	811.73	32.74
Charges paid in advance			311.09	294.31	60.16		
Operation and mainte- nance refunds				111.96			
Miscellaneous:							
Rentals of irrigation water	5,036.50	24,397.77	669.00	18,217.92	4,416.00	6,176.85	3.09
Rentals, power and light	13,610.94	216,448.31	13,593.25	189,752.42		25,806.75	1,190.14
Rentals, grazing and and farming lands	5,824.42	35,450.82	4,544.54	32,254.44			3,196.38
Construction forfeitures			2,770.00	8,595.60			
Construction penalties and interest	2,360.45	9,712.00	2,344.55	9,696.10			15.90
Other			4,576.56	193,260.13			246.86
Grand total collections			168,352.53	1,929,711.85			

<sup>1</sup> Actual construction accruals for fiscal year..... \$63,677.67  
Less deductions due to cancellations, relinquishments, permanent reduction  
of area, and credit of \$8 per acre on part of \$60 lands..... 18,774.36

Net accruals..... 44,903.31

<sup>2</sup> Actual operation and maintenance accruals for fiscal year..... \$118,683.84  
Less deductions due to cancellations and relinquishments..... 9,078.36

Net accruals..... 109,605.48

<sup>3</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 8.2 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1925, 11.4 per cent of total accruals.

## NEW MEXICO, CARLSBAD PROJECT

The Carlsbad project is located in Eddy County, N. Mex. The length of the irrigation season is 260 days, which includes two weeks in winter. The average elevation of the irrigable area is 3,100 feet. The rainfall averages 14.2 inches. The average of recorded temperatures for a period of 23 years ranges from 112° to -7° F. The soil of the irrigable area is Pecos clay and sandy loam, with high lime content. The principal products are cotton, alfalfa, and miscellaneous grains and fruits. The principal markets are Carlsbad, Kansas City, Chicago, New Orleans, and Galveston.

*Operation and settlement data, Carlsbad project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water	26,000	26,000	25,000	25,000	25,045
Acreage irrigated	22,170	23,810	24,076	24,000	24,460
Miles of canal operated	45	45	45	45	45
Water diverted (acre-feet)	131,673	137,500	116,700	126,200	133,360
Water delivered to land (acre-feet)	53,644	59,371	56,687	57,256	66,384
Per acre of land irrigated (acre-feet)	2.42	2.49	2.36	2.38	2.71
Total number of farms on project	1,770	1,769	1,796	1,808	1,824
Population	1,575	1,435	1,580	2,128	2,060
Number of irrigated farms	363	426	332	388	412
Operated by owners or managers	189	277	184	188	169
Operated by tenants	267	149	149	200	243
Population	1,575	1,435	1,580	2,128	2,060
Number of towns	4	4	4	4	4
Population	3,375	3,375	3,440	3,440	3,440
Total population in towns and on farms	4,950	4,810	5,020	5,568	5,500
Number of public schools	13	13	10	12	8
Number of churches	11	11	12	12	12
Number of banks	5	3	3	1	2
Total capital stock	\$275,000	\$225,000	\$225,000	\$25,000	\$85,000
Amount of deposits	\$1,049,924	\$1,176,441	\$1,106,300	\$100,000	\$525,000
Number of depositors	2,617	2,350	2,374	4300	1,350

<sup>1</sup> Water-right applications.

<sup>2</sup> Many farms were operated by one man.

<sup>3</sup> Several tenants on one farm, also operated in part by owner.

<sup>4</sup> Two bank failures January 2 and May 10, 1924.

*Appropriations*

<b>Fiscal year 1925:</b>	
Congressional authorizations	\$66,817.16
Disbursements	\$41,775.74
Liabilities outstanding	1,832.48
	43,008.22
Unencumbered balance June 30, 1925	23,208.94
<b>Fiscal year 1926: Amount specified in appropriation acts</b>	70,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers	\$2,005,249.02	\$17,305.25	\$20,984.02	\$2,062,538.29
Less collections	1,198,485.78			1,198,485.78
Net investment June 30, 1925	806,763.24	17,305.25	20,984.02	854,052.51

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$19,967.82	\$1,438,664.72
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 1,919.13	<sup>1</sup> 13,624.41
Operation and maintenance arrearages to be repaid with construction.....		1,934.00
		\$1,426,974.31
Less:		
Contributed funds.....		7,980.06
Construction revenues.....	868.02	16,049.31
		24,029.37
Total to be repaid by water users.....	17,180.67	1,402,944.94
Contracted repayments: Water-right contracts (Individuals).....	420.00	1,424,312.75

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$42,374.33	\$556,545.63	\$41,182.92	\$579,730.13
Operation and maintenance returns:				
Contracted.....	51,227.06	553,468.44	51,227.06	553,468.44
Penalties.....	6,973.29	23,538.90	3,497.10	24,812.17
Discounts (contra).....	1,871.82	9,187.30	1,870.15	9,619.38
Miscellaneous revenues.....	2,626.95	15,838.08	2,310.47	16,008.09
Subtotal.....	58,955.48	583,158.07	55,164.48	585,269.22
Other credits: Operation and maintenance arrearages to be repaid with construction.....		1,934.00		1,934.00
Total.....	58,955.48	585,092.07	55,164.48	587,203.22
Results, excess.....	16,581.15	28,546.44	13,981.56	7,483.19

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
			Cash		Other credits		
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges .....	\$58,099.37	\$533,534.56	\$67,859.65	\$519,527.75			\$14,006.81
Contributed funds .....		7,980.06		7,980.06			
Total .....	58,099.37	541,514.62	67,359.65	527,507.81			14,006.81
Charges paid in advance .....			263.90	465.21			
Operation and maintenance:							
Water-right charges, project lands (25,038.6 acres) .....	51,227.06	553,468.44	62,606.57	532,744.90	\$1,870.15	\$9,619.38	11,104.16
Penalties and interest .....	3,497.10	24,812.17	3,497.10	24,812.17			
Miscellaneous:							
Rentals of irrigation water .....	4,164.04	26,097.05	4,164.04	26,097.05			
Rentals of grazing lands .....	476.18	13,642.42	361.62	12,993.42			649.00
Construction forfeitures .....		269.70		269.70			
Construction penalties and interest .....	3,520.05	27,647.18	3,520.05	27,647.18			
Other .....			1,426.78	45,948.34			72.65
Grand total collections .....			142,670.91	1,198,485.78			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 2.63 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 2.01 per cent of total accruals.

## NEW MEXICO-TEXAS, RIO GRANDE PROJECT

The Rio Grande project is international and interstate, including approximately 155,000 acres of land in New Mexico and Texas, and approximately 25,000 acres in the Republic of Mexico. The average annual rainfall is 10 inches. The irrigation season normally is from February 1 to October 15.

*Operation and settlement data, Rio Grande project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	109,000	109,000	116,000	124,000	142,000
Acreage irrigated.....	<sup>1</sup> 73,346	<sup>2</sup> 85,580	<sup>3</sup> 89,589	<sup>4</sup> 92,220	<sup>5</sup> 116,000
Miles canal and drain operated.....	546	586	645	808	926
Water diverted (acre-feet).....	<sup>6</sup> 677,953	<sup>6</sup> 782,366	<sup>6</sup> 906,728	<sup>6</sup> 1,036,419	1,360,280
Water delivered to land (acre-feet).....	<sup>7</sup> 226,464	<sup>7</sup> 197,088	204,452	188,819	240,000
Per acre of land irrigated (acre-feet).....	2.96	2.55	2.28	2.18	2.18
Total number of farms on project.....	3,021	3,204	3,534	3,743	4,800
Population.....	12,199	11,774	11,267	15,925	28,000
Number of irrigated farms.....	3,021	3,222	3,534	3,743	4,800
Operated by owners or managers.....	2,668	2,628	2,954	3,014	3,600
Operated by tenants.....	353	594	580	729	1,200
Number of towns.....	29	29	34	42	42
Population.....	100,235	101,235	110,442	111,883	106,000
Total population in towns and on farms.....	<sup>8</sup> 112,434	<sup>8</sup> 113,009	<sup>8</sup> 121,709	127,808	134,000
Number of public schools.....	102	103	49	73	75
Number of churches.....	105	106	110	115	120
Number of banks.....	14	13	13	9	8
Total amount of capital stock.....	\$2,990,000	\$2,950,000	\$2,950,000	\$2,675,000	\$2,000,000
Amount of deposits.....	\$30,898,499	\$28,194,815	\$30,000,000	\$27,323,442	\$26,500,000
Number of depositors.....	31,716	30,000	31,000	30,000	30,000

<sup>1</sup> Land irrigated by bureau distribution system only.

<sup>2</sup> Includes 1,120 acres, Fort Hancock.

<sup>3</sup> Includes 5,369 acres in Palomas and Fort Hancock, outside project limits, irrigated under surplus stored water contract.

<sup>4</sup> Project proper.

<sup>5</sup> Does not include 240 acres in Palomas, and 8,964 acres in Hancock section irrigated under surplus and waste water contracts.

<sup>6</sup> Total diversions, including water wasted and rediverted from river below.

<sup>7</sup> Includes delivery to farms by Bureau of Reclamation operation and to heads of community ditches on project.

<sup>8</sup> 5,000 soldiers included in El Paso's population.

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$866,597.76
Disbursements.....		\$735,328.92
Liabilities outstanding.....		52,491.74
		787,820.66
Unencumbered balance June 30, 1925.....		78,777.10
Fiscal year 1926: Amount specified in appropriation acts.....		650,000.00

*Voucher transactions*

	Reclamation fund	Rio Grande Dam	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$15,029,376.08	\$1,000,000.00	\$441,171.78	\$16,470,547.81
Less collections.....	3,062,240.67			3,062,240.67
Net investment June 30, 1925.....	11,967,135.36	1,000,000.00	441,171.78	13,408,307.14

*Construction account*

	Fiscal year 1926	To June 30, 1925
Cost of irrigation works: Original construction.....	\$467,540.58	\$13,802,248.22
Operation maintenance prior to public notice (net).....	19,751.06	1,274,936.78
		\$12,527,311.44
Less:		
Nonreimbursable Rio Grande Dam appropriation.....		1,000,000.00
Construction revenues.....	1,452.64	37,345.60
		1,037,345.60
Total to be repaid by water users.....	446,336.88	12,490,965.84
Contracted repayments: Contracts, Elephant Butte irrigation district and El Paso water improvement district No. 1.	5,860,600.00	12,500,086.00

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$262,586.81	\$904,010.38	\$306,859.14	\$1,075,650.44
Operation and maintenance returns:				
Contracted.....	255,774.67	899,701.72	254,332.81	899,701.72
Penalties.....	1,256.50	1,426.46		1,426.46
Discounts.....		4,486.44		4,486.44
Miscellaneous revenues.....	6,723.00	7,306.64	6,913.50	7,589.14
Total.....	262,241.17	904,010.38	261,246.31	904,200.86
Results, deficit.....	645.64		48,612.83	171,449.58

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$197,330.40	\$472,345.20	\$197,330.40	\$472,345.20	.....	.....	.....
Charges paid in advance.....			12,905.70	12,905.70	.....	.....	.....
Operation and maintenance:							
Irrigation districts (150,000 approximate acres).....	211,833.40	899,145.80	211,877.10	797,571.50	.....	\$4,486.44	\$7,057.86
Penalties and interest.....		1,426.46		1,426.46	.....		
Charges paid in advance.....			1,786.12	89.46	.....		
Operation and maintenance refunds.....				333.52	.....		
Miscellaneous:							
Rentals of irrigation water.....	26,515.56	1,144,918.68	37,399.20	1,118,215.51	.....		26,708.17
Rentals, power and light.....		2,243.33		2,243.33	.....		
Rentals, grazing and farming lands.....	180.00	2,111.70	111.50	2,063.20	.....		48.80
Penalties and interest.....	1,680.21	2,563.76	1,680.21	2,563.76	.....		
Other.....			48,129.92	651,493.09	.....		450.13
Grand total collections.....			508,647.91	2,062,240.67	.....		

<sup>1</sup> Contra.

NOTE.—Uncollected operation and maintenance charges as of June 30, 1925, 0.8 per cent of total accruals.

## NORTH DAKOTA, WILLISTON PROJECT

(To be sold)

The Williston project is located in Williams County, N. Dak., on the Great Northern Railway and the Missouri River. The irrigation season is 80 days. The average rainfall is 13 inches; the average high temperature is 99° and the average low -37° F. The principal products are sugar beets, alfalfa, dairy cows, and hogs, corn, and potatoes.

*Operation and settlement data, Williston project*

Item	1920	1921	1922	1923	1924
Area for which bureau was prepared to supply water.....	7,653	7,653	7,653	7,650	7,650
Acres irrigated.....	2,810	2,080	1,583	1,170	1,180
Miles of canal operated.....	31	35	35	35	38
Water diverted (acre-feet).....	4,000	2,383	1,942	1,423	1,759
Water delivered to land (acre-feet).....	2,684	1,624	1,352	887	1,135
Water per acre of land irrigated (acre-feet).....	0.97	0.78	0.85	0.76	.96
Total number of farms on project.....	105	105	105	144	135
Population.....	200	210	220	241	235
Number of irrigated farms.....	94	76	73	63	60
Operated by owners or managers.....	47	39	40	35	30
Operated by tenants.....	19	12	9	13	27
Operated by nonresidents.....	28	25	24	15	3
Population.....	194	200	212	234	215
Number of towns.....	2	2	2	2	2
Population.....	5,000	5,000	4,500	4,500	4,400
Total population of towns and farms.....	5,200	5,210	4,739	4,741	4,635
Number of public schools.....	6	6	6	6	7
Number of churches.....	6	7	7	7	7
Number of banks.....	3	3	2	1	2
Total capital stock.....	\$260,000	\$260,000	\$185,000	\$109,000	\$150,000
Amount of deposits.....	\$2,000,000	\$1,800,000	\$1,700,800	\$1,599,000	\$1,650,000
Number of depositors.....	5,010	3,680	2,500	3,000	3,000

<sup>1</sup> Does not include hired help or beet workers.

*Appropriations*

<b>Fiscal year 1925:</b>	
Congressional authorizations.....	\$142,000.28
Disbursements.....	\$79,458.28
Liabilities outstanding.....	2,047.41
	<u>\$1,505.69</u>
Unencumbered balance June 30, 1925.....	60,553.54
<b>Fiscal year 1926: Amount specified in appropriation acts.....</b>	<b>26,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,398,593.82	\$25,279.34	\$1,398,593.16
Less collections.....	517,396.87		517,396.87
Net investment, June 30, 1926.....	881,197.95	25,279.34	876,467.39

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....		\$470, 798. 69
Supplemental construction.....	2, 072. 39	30, 066. 47
Total construction cost.....	2, 072. 39	500, 855. 16
Operation and maintenance prior to public notice (net).....		165. 00
Operation and maintenance deficits and arrearages to be repaid with construction.....		168, 471. 56
Less construction revenues.....	664. 03	\$669, 161. 72
Total to be repaid by water users.....	1, 408. 26	10, 744. 53
Contracted repayments: Contract; Williston irrigation district.....		658, 416. 89
		489, 375. 30

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$75, 701. 98	\$841, 239. 68	\$80, 091. 80	\$877, 401. 13
Operation and maintenance returns:				
Contracted.....		26, 677. 75	29, 300. 87	55, 878. 62
Penalties.....		1, 918. 76		1, 918. 76
Miscellaneous revenues.....	44, 501. 11	439, 401. 69	47, 043. 53	463, 149. 37
Subtotals.....	44, 501. 11	467, 998. 50	76, 349. 40	519, 943. 75
Other credits:				
Operation and maintenance deficits and arrearages to be repaid with construction.....		168, 471. 56		168, 471. 56
Operation and maintenance deficit uncollectible.....		178, 667. 20		178, 667. 20
Total.....	44, 501. 11	815, 137. 26	76, 349. 40	867, 082. 51
Results, deficit.....	29, 200. 87	26, 102. 42	3, 842. 49	10, 318. 63

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Un- collected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction charges paid in advance.....				\$3, 250. 63			
Operation and maintenance:							
Irrigation districts (6,587.4 approximate acres).....	\$29, 200. 87	\$55, 878. 62	\$11, 535. 57	38, 213. 32			\$17, 665. 30
Penalties and interest.....		1, 918. 76		1, 918. 76			
Miscellaneous:							
Rentals of irrigation water.....		2, 117. 28		2, 117. 28			
Rentals of power and light.....	46, 630. 48	456, 566. 68	46, 411. 48	453, 091. 48			3, 475. 20
Rentals, grazing and farming lands.....		249. 98		249. 98			
Construction forfeitures.....		655. 32		655. 32			
Other.....			1, 472. 20	12, 899. 10			81. 49
Grand total collections.....			59, 419. 25	517, 395. 87			

NOTE.—Uncollected operation and maintenance charges as of June 30, 1925, 31 per cent of total accruals.

## OREGON, UMATILLA PROJECT

The Umatilla project is located in Umatilla and Morrow Counties, Oreg. The average elevation of the irrigable area is 470 feet above sea level, the average rainfall for 15 years is 8.62 inches, and the length of the irrigation season will approximate 210 days. The principal products are alfalfa, fruits, vegetables, honey, and dairy products.

*Operation and settlement data, Umatilla project*

Item	1920	1921	1922	1923	1924
Area for which bureau was prepared to supply water ..	24,395	24,400	24,592	24,470	24,470
Miles of canal operated ..	171	177	186	188	188
Acreage irrigated ..	12,080	13,150	13,273	13,330	13,180
Water diverted (acre-feet) ..	165,534	130,872	129,187	127,504	113,816
Water delivered to land (acre-feet) ..	50,651	57,492	59,313	62,142	59,427
Per acre of land irrigated (acre-feet) ..	4.21	4.37	4.47	4.63	4.52
Total number of farms on project ..	1,000	1,000	1,000	1,011	1,011
Population ..	1,472	1,562	1,613	1,491	1,529
Number of irrigated farms ..	528	544	558	540	534
Operated by owners or managers ..	450	442	435	418	367
Operated by tenants ..	78	102	123	122	167
Population ..	1,280	1,562	1,613	1,491	1,529
Number of towns ..	4	4	4	4	4
Population ..	1,280	1,280	1,280	1,280	1,280
Total population of towns and farms ..	2,752	2,842	2,893	2,771	2,809
Number of public schools ..	6	6	6	6	6
Number of churches ..	9	9	9	9	9
Number of banks ..	1	1	1	1	1
Total capital stock ..	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Amount of deposits ..	\$217,590	\$235,367	\$300,600	\$300,000	\$290,000
Number of depositors ..	1,200	1,200	1,200	1,200	1,200

*Appropriations*

<b>Fiscal year, 1925:</b>	
Congressional authorizations ..	\$978,403.11
Disbursements ..	\$723,449.93
Liabilities outstanding ..	99,919.29
	<u>798,369.22</u>
Unencumbered balance June 30, 1925 ..	180,033.89
<b>Fiscal year 1926: Amount specified in appropriation act ..</b>	<b>840,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers ..	\$5,200,585.42	\$47,945.96	\$5,248,531.38
Less collections ..	962,112.92		962,112.92
Net investment June 30, 1925 ..	4,238,472.50	47,945.96	4,286,418.46

*Construction account*

	Fiscal year 1925	To June 30, 1925
<b>Cost of irrigation works:</b>		
Original construction ..	\$720,357.34	\$3,639,226.85
Supplemental construction ..	176,244.92	638,197.33
Total construction cost ..	896,602.26	4,277,334.18
Operation and maintenance deficits and arrearages to be repaid with construction ..		190,627.95
		<u>\$4,467,962.13</u>
<b>Less:</b>		
Contributed funds ..		1,000.00
Construction revenues ..	4,829.93	26,806.10
Total to be repaid by water users ..	891,772.33	4,440,357.03
<b>Contracted repayments, water-right contracts:</b>		
Individuals ..		9,897.00
Warren Act ..	1,023,750.00	1,723,550.00
Irrigation districts ..		2,690,376.97
Total ..	1,023,750.00	4,423,823.97



*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$34,049.37	\$522,478.67	\$31,041.53	\$641,064.56
Operation and maintenance returns:				
Contracted.....	32,684.10	400,890.49	32,684.10	400,890.49
Penalties.....	28.13	6,375.70	4.29	6,375.70
Discounts.....	7.74	3,294.17	11.54	3,305.71
Miscellaneous revenues.....	1,735.65	38,244.74	1,148.18	38,774.74
Subtotals.....	34,440.14	442,216.76	33,825.03	442,735.23
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		190,627.95		190,627.95
Total.....	34,440.14	632,844.71	33,825.03	633,363.17
Results:				
Excess.....	390.77	10,366.04	2,783.50	
Deficit.....				7,701.89

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges .....	\$82, 441. 12	\$565, 223. 80	\$6, 269. 03	\$387, 677. 65			\$177, 546. 15
Contributed funds .....		1, 000. 00		1, 000. 00			
Total .....	82, 441. 12	566, 223. 80	6, 269. 03	388, 677. 65			177, 546. 15
Charges paid in advance .....			1, 838. 88	14, 891. 87			
Construction refunds .....				68. 00			
Operation and maintenance:							
Water-right charges project lands (111 acres) .....	236. 38	2, 240. 30	120. 79	1, 701. 08	\$6. 34	\$108. 97	430. 25
Warren Act lands (26,120 approximate acres) .....	134. 00	745. 45	175. 30	686. 24	5. 20	29. 21	30. 00
Irrigation districts (24,366 approximate acres) .....	40, 449. 83	360, 218. 19	27, 149. 61	308, 927. 98		3, 167. 53	48, 122. 78
Total .....	40, 820. 21	363, 203. 94	27, 445. 70	311, 315. 25	11. 54	3, 305. 71	48, 582. 98
Penalties and interest .....	4. 29	6, 375. 70	4. 29	6, 375. 70			
Charges paid in advance .....				390. 00			
Operation and maintenance refunds .....				9. 55			
Miscellaneous:							
Rentals of irrigation water .....	837. 50	34, 145. 54	837. 50	34, 145. 54			
Rentals grazing and farm- ing lands .....	496. 20	2, 540. 75	266. 20	2, 317. 75			223. 00
Construction forfeitures .....				6, 701. 14			
Construction penalties and interest .....	10, 414. 48	28, 174. 08	10, 414. 48	28, 174. 08			
Other .....			7, 061. 31	169, 351. 69			1, 293. 57
Grand total collections .....			51, 760. 13	962, 112. 92			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water right charges as of June 30, 1925, 81.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 13.4 per cent of total accruals.

**OREGON-CALIFORNIA, KLAMATH PROJECT**

The Klamath project is located in southern Oregon and northern California. The average elevation of the irrigable lands is about 4,100 feet above sea level. The principal agricultural products are alfalfa and grain; stock raising is practiced to a large extent; the dairying industry, begun several years ago, is increasing rapidly. The principal markets are Portland, Oreg., and Sacramento and San Francisco, Calif. The irrigation season usually begins about May 1, and ends on September 30.

*Operation and settlement data, Klamath project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	50,000	51,000	51,000	54,100	<sup>1</sup> 53,900
Acreage irrigated.....	44,800	44,883	44,929	<sup>2</sup> 46,624	<sup>3</sup> 47,300
Miles of canal operated.....	225	225	225	277	277
Water diverted (acre-feet).....	114,179	106,104	119,830	124,137	168,980
Water delivered (acre-feet).....	49,754	48,713	49,863	56,619	69,100
Per acre of land (acre-feet).....	1.11	1.11	1.11	1.21	1.46
Total number of farms on project.....	570	570	570	600	600
Population.....	2,060	2,200	2,200	2,600	2,600
Number of irrigated farms.....	542	542	542	580	600
Operated by owners or managers.....	352	430	430	450	470
Operated by tenants.....	190	112	112	130	130
Population.....	1,650	1,720	1,720	1,800	1,800
Number of towns.....	5	5	5	5	5
Population.....	5,500	5,800	6,200	7,000	7,000
Total population, towns and farms.....	7,550	8,000	8,400	9,600	9,600
Number of public schools.....	21	22	22	24	24
Number of churches.....	10	10	10	11	12
Number of banks.....	6	5	5	5	5
Total capital stock.....	\$595,000	\$645,000	\$255,000	\$350,000	\$355,000
Amount of deposits.....	\$4,500,000	\$3,500,000	\$3,500,000	\$4,200,000	\$4,000,000
Number of depositors.....	9,250	8,000	8,000	8,200	8,200

<sup>1</sup> Project proper, 42,590 acres.<sup>2</sup> Includes 9,700 acres of Van Brimmer lands and in miscellaneous pumping districts.<sup>3</sup> Includes 8,900 acres of Van Brimmer lands and in miscellaneous pumping districts; project proper, 38,400.*Appropriation*

Fiscal year 1925:		
Congressional authorizations.....		\$685,864.41
Disbursements.....		\$354,882.27
Liabilities outstanding.....		48,845.31
		403,237.58
Unencumbered balance June 30, 1925.....		282,636.83
Fiscal year 1926: Amount specified in appropriation acts.....		561,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$5,968,180.20	\$72,790.02	\$5,940,940.22
Less collections.....	1,562,548.85		1,562,548.85
Net investment June 30, 1925.....	4,405,631.35	72,790.02	4,478,400.37

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$607,568.48	\$4,521,869.81
Supplemental construction.....		545,873.58
Value of works taken over.....		6,705.07
Total construction cost.....	607,568.48	5,074,439.41
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 2,369.34	58,782.98
Operation and maintenance deficits and arrearages to be repaid with construction.....		3,712.08
Less construction revenues.....	28,679.96	\$5,134,924.27
Total to be repaid by water users.....	580,519.16	5,071,252.39
Contracted repayments, water-right contracts:		4,985,810.98
Individuals.....	<sup>1</sup> 1,788.50	260,702.70
Warren Act.....	747.50	455,725.74
Irrigation districts.....	30,400.00	3,020,776.76
Special.....		254,508.40
Total.....	29,350.00	3,994,716.60

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1924	To Dec. 31 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$67,978.08	\$686,886.86	\$78,871.00	\$781,662.99
Operation and maintenance returns:				
Contracted.....	57,068.20	675,100.65	58,453.51	675,085.65
Penalties.....	87.81	2,817.88	334.20	2,108.71
Discounts (contra).....	132.54	4,645.96	108.31	4,645.96
Miscellaneous revenues.....	427.89	12,551.90	1,282.88	12,043.84
Subtotals.....	57,451.36	686,104.47	60,919.28	686,587.21
Other credits: Operation and maintenance, deficits and arrearages to be repaid with construction.....		3,712.08		1,712.08
Total.....	57,451.36	689,816.50	60,919.28	688,299.27
Results:				
Excess.....		3,280.14		
Deficit.....	10,526.72		12,952.32	41,363.63

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$70,283.48	\$692,662.51	\$71,189.26	\$661,344.95			\$31,347.56
Charges paid in advance.....			14,824.99	228.58			
Construction refunds.....				2,467.65			
Operation and maintenance:							
Water-right charges, pro- ject lands (individual contracts 3,471.6 acres).....	5,270.67	21,097.65	4,639.82	17,383.84	\$108.31	\$422.95	3,290.86
Warren Act lands (9,834.8 approximate acres).....	741.29	3,568.44	678.51	3,319.15			269.29
Irrigation districts (41- 486.9 approximate acres).....	58,383.03	588,678.79	53,297.06	527,141.05		29,816.96	31,720.78
Total.....	64,394.99	613,364.88	58,615.39	547,844.04	108.31	30,239.91	35,280.93
Penalties and interest.....	334.20	3,103.71	334.20	3,103.71			
Charges paid in advance.....			127.44	42.75			
Operation and mainten- ance refunds.....				60.75			
Miscellaneous:							
Rentals of irrigation water.....	8,724.06	52,705.39	8,788.46	52,580.89			124.50
Rentals power and light.....		7,697.18		7,697.18			
Rentals grazing and farm- ing lands.....	24,984.30	201,749.45	25,520.30	201,665.45		84.00	
Construction forfeitures.....			42.50	5,088.40			
Penalties and interest.....			1,083.76	5,663.29			
Other.....			9,829.33	74,766.21			1,867.17
Grand total collections.....			170,500.77	1,562,548.85			

<sup>1</sup> Contra.

NORM.—Uncollected construction water-right charges as of June 30, 1925, 4.5 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1925, 5.8 per cent of totals accruals.

## SOUTH DAKOTA, BELLE FOURCHE PROJECT

The Belle Fourche project is located in western South Dakota, a little north and east of the Black Hills. The climate is semiarid, with an average annual rainfall of about 14 inches; the temperatures range from  $-38^{\circ}$  to  $105^{\circ}$  F. The character of the soils varies from light sandy loam to heavy clay, the clay soils predominating. The principal products are alfalfa, wheat, oats, corn, potatoes, sugar beets, garden truck, and livestock, the chief markets for which are Omaha, Minneapolis, and Chicago.

*Operation and settlement data, Belle Fourche project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau is prepared to supply water.....	82,430	83,328	82,190	81,900	81,870
Acreage irrigated.....	59,850	55,100	31,150	30,550	48,400
Miles of canal operated.....	615	615	615	506	455
Water diverted (acre-feet) from Belle Fourche River.....	101,113	86,791	115,629	99,176	101,915
Water delivered to farms (acre-feet).....	36,616	71,715	28,421	22,290	57,928
Per acre of land irrigated (acre-feet).....	0.61	1.3	1.09	0.73	1.20
Total number of farms on project.....	1,292	1,292	1,292	1,292	1,183
Population.....	2,700	2,700	2,700	2,500	2,020
Number of irrigated farms.....	1,024	1,083	1,083	1,083	1,854
Operated by owners or managers.....	892	451	833	772	272
Operated by tenants.....	232	582	116	198	485
Population.....	2,650	2,510	2,313	2,035	2,020
Number of towns.....	5	5	5	5	5
Population.....	2,350	2,386	2,386	2,350	2,350
Total population in towns and on farms.....	5,050	5,086	5,086	4,850	4,370
Number of public schools.....	26	24	24	25	27
Number of churches.....	9	9	9	9	9
Number of banks.....	9	9	9	6	4
Total capital stock.....	\$250,000	\$250,000	\$250,000	\$150,000	\$185,000
Amount of deposits.....	\$2,657,621	\$2,373,380	\$2,608,200	\$2,145,000	\$2,125,000
Number of depositors.....	6,560		6,500	4,500	6,000

<sup>1</sup> 86 farms not operated.

<sup>2</sup> 75 farms not operated.

<sup>3</sup> 97 farms not operated.

<sup>4</sup> Estimated.

*Appropriations*

<b>Fiscal year 1925:</b>	
Congressional authorizations.....	\$200,794.56
Disbursements.....	\$63,732.14
Liabilities outstanding.....	7,512.94
	71,265.08
Unencumbered balance June 30, 1925.....	129,529.48
<b>Fiscal year 1926:</b> Amount specified in appropriation acts.....	165,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,657,266.68	\$37,170.22	\$50,273.32	\$4,744,710.22
Less collections.....	1,096,289.80			1,096,289.80
<b>Net investment June 30, 1925.....</b>	<b>3,560,976.88</b>	<b>37,170.22</b>	<b>50,273.32</b>	<b>3,648,420.42</b>

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....		\$3,531,454.53
Supplemental construction.....		34,669.88
Total construction cost.....		3,566,124.41
Operation and maintenance prior to public notice (net).....		1,989.08
Operation and maintenance deficits and arrearages to be repaid with construction.....		506,436.99
Less construction revenues.....		
Total to be repaid by water users.....		\$4,070,572.37
Contracted repayments: Contract, Belle Fourche Irrigation district.....		16,565.25
		4,054,007.02
		4,345,277.42

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$73,533.43	\$1,088,283.37	\$79,246.27	\$1,123,452.16
Operation and maintenance returns:				
Contracted.....	75,000.00	638,721.89	75,000.00	638,721.89
Penalties.....		31,955.32	1,430.25	31,955.32
Disbounts (contra).....		9,241.55		9,241.55
Miscellaneous revenues.....	1,786.24	12,477.44	2,356.96	12,636.90
Subtotals.....	76,786.24	673,913.10	76,928.71	675,262.55
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		506,436.99		506,436.99
Total.....	76,786.24	1,180,350.09	76,928.71	1,181,699.54
Results:				
Excess.....	3,252.81	92,066.72		58,247.38
Deficit.....			2,317.56	

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$190,428.26	\$669,204.06	\$45,000.80	\$471,758.06		\$206.57	\$187,270.34
Charges paid in advance.....			145,998.80	8,962.94			
Construction refunds.....				423.42			
Operation and maintenance:							
Water-right charges, ir- rigation district, (76- 370 approximate acres).....	76,285.48	601,858.81	22,771.89	463,342.32		9,376.82	109,139.17
Penalties and interest.....	1,430.25	31,955.32	1,478.87	17,834.29	\$1,699.29	12,390.61	1,740.42
Charges paid in advance.....			22,771.89	31,636.77			
Operation and mainte- nance refunds.....				384.97			
Miscellaneous:							
Rentals of irrigation water.....	636.07	6,000.80	636.07	5,833.09		17.80	150.00
Rentals, grazing and farming lands.....	345.17	987.11	247.57	885.51			101.60
Construction forfeitures.....				1,116.10			
Penalties and interest.....	7,404.64	28,344.75	7,006.18	22,170.69		339.66	5,834.40
Other.....			2,449.39	52,067.65			60.62
Grand total collections.....			11,818.05	1,096,289.80			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 28.3 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 18.1 per cent of total accruals.

## UTAH, STRAWBERRY VALLEY PROJECT

The Strawberry Valley project is located in the north central part of Utah; the irrigable area lies along the southeastern shore of Utah Lake, in Utah County, and the storage works, in Wasatch County, 30 miles east of Springville. The length of the irrigation season is 169 days, from April 15 to September 30. The average elevation of the project lands is about 4,600 feet above sea level. The average rainfall at Payson for a period of 16 years is 18½ inches, most of which occurs from September 1 to May 1. The climate is temperate, varying from 0° to 95° F. The last killing frost in the spring usually occurs prior to May 10, and the first in the fall after October 1. The soil varies from sandy loam to heavy clay and varying mixtures of both, with black alluvium and loam in the bottom lands. The mesa lands are sandy loam underlain with gravel so that natural drainage is excellent. The principal crops are wheat, oats, barley, millet, alfalfa, timothy, sugar beets, potatoes, corn, cane, apples, plums, pears, peaches, prunes, apricots, cherries, melons, and all kinds of vegetables. Sugar beets, cereals, and hay constitute the staple crops.

*Operation and settlement data, Strawberry Valley project*

Item	1920	1921	1922	1923	1924
Acres for which bureau was prepared to supply water.....	50,000	53,889	53,889	53,889	53,890
Acres irrigated.....	1 45,450	1 47,446	1 47,446	1 47,480	1 47,560
Miles of canal operated.....	9.3	9.3	9.3	9.3	9.3
Water diverted (acre-feet).....	69,100	83,000	79,500	83,880	* 113,750
Water delivered to land (acre-feet).....	57,900	71,200	73,461	79,674	106,203
Per acre of land irrigated (acre-feet).....	1.27	1.50	1.55	1.68	2.23
Total number of farms on project.....	3,000	3,200	3,200	3,113	3,113
Population.....	7,000	7,000	7,000	7,000	7,000
Number of irrigated farms.....	2,700	2,740	2,741	2,741	2,741
Operated by owners or managers.....	2,200	2,340	2,291	2,291	2,300
Operated by tenants.....	500	400	450	450	441
Population.....	6,500	6,500	6,500	6,500	6,500
Number of towns.....	12	12	12	12	12
Population.....	16,000	16,000	16,000	16,000	16,200
Total population of towns and farms.....	23,000	23,000	23,000	23,000	23,200
Number of public schools.....	22	22	22	23	24
Number of churches.....	23	23	25	25	26
Number of banks.....	6	6	6	4	5
Total capital stock.....	\$285,000	\$285,000	\$285,000	\$210,000	\$235,000
Amount of deposits.....	\$2,180,000	\$1,750,000	\$1,900,000	* 1,429,354	\$1,500,000
Number of depositors.....	9,830	10,000	10,000	7,000	7,250

\* Project proper, 34,290 acres; reported under crop census, 43,320 acres.

\* 36,000 acre-feet of water distributed free and rented for irrigation purposes for replanting and to make up water shortages due to low natural run-off.

\* Two bank failures during the year.

\* Figures do not include two banks closed during 1923.

*Appropriations***Fiscal year 1925:**

Congressional authorizations.....	\$105,617.09
Disbursements.....	\$42,251.24
Liabilities outstanding.....	3,165.29

Unencumbered balance to June 30, 1925..... 45,416.49

Fiscal year 1926: Amount specified in appropriation acts.....	60,400.60
	\$9,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,236,685.74	\$440.00	\$34,682.99	\$4,271,808.73
Less collections.....	1,452,243.58			1,452,243.58
Net investment June 30, 1925.....	1,784,442.16	440.00	34,682.99	2,819,665.15

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works: Original construction.....	\$8,401.23	\$3,490,638.80
Operation and maintenance prior to public notice (net).....		12,111.90
Operation and maintenance deficits and arrearages to be repaid with construction.....	1,346.33	1,346.33
Less construction revenues.....	8,540.79	\$3,512,007.05
		53,315.79
Total to be repaid by water users.....	1,206.76	3,459,781.24
Contracted repayments, water-right contracts:		
Individuals.....	12,161.26	2,453,886.96
Warren Act.....		83,700.00
Irrigation districts.....		460,650.00
Special.....		105,180.00
Total.....	12,161.26	3,103,416.96

*Operation and maintenance account*

	Calendar year 1924	To Dec 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$23,694.58	\$396,971.96	\$21,115.59	\$406,653.99
Operation and maintenance returns:				
Contracted.....	13,965.67	385,231.29	14,686.67	384,906.29
Penalties.....	2,783.46	6,255.67	2,514.42	6,433.26
Discounts (contra).....	1,000.27	10,280.16	997.56	10,570.41
Miscellaneous revenues.....	6,400.61	17,083.43	6,236.66	17,358.26
Subtotals.....	22,149.47	398,290.23	22,439.19	398,067.40
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	1,346.33	1,346.33	1,346.33	1,346.33
Total.....	23,495.80	399,636.56	23,785.52	399,433.73
Results:				
Excess.....		2,064.00	2,660.93	
Deficit.....	198.78			7,220.26

*Status of current accounts receivable, June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$155,419.90	\$765,319.27	\$76,841.57	\$556,638.18			\$208,681.09
Charges paid in advance.....			10.71				
Operation and maintenance:							
Water-right charges project lands (\$2,063.10 acres).....	33,410.56	307,153.17	17,296.23	246,223.78	\$635.35	\$9,148.06	51,781.31
Warren Act lands (5,575.65 approximate acres).....	1,876.44	14,366.04	1,521.73	12,813.02	74.96	488.77	1,064.26
Irrigation districts (10,000 approximate acres).....	5,745.00	38,736.25	5,457.75	37,802.60	287.25	983.56	
Total.....	41,032.00	360,255.46	24,274.71	296,839.49	997.56	10,570.41	52,845.56
Penalties and interest.....	2,514.42	6,433.26	1,799.51	5,718.35			714.91
Charges paid in advance.....			12.77	1.59			
Operation and mainte- nance refunds.....				36.48			
Miscellaneous:							
Rentals of irrigation water.....	5,734.90	14,298.54	5,734.90	14,298.54			
Rentals, power and light.....	25,823.45	177,383.10	23,237.01	173,198.73			4,134.37
Rentals, grazing, and farm- ing lands.....	15,470.70	166,751.06	15,470.70	166,751.06			
Construction forfeitures.....			258.75	278.75			
Construction penalties and interest.....	9,460.09	19,206.33	8,030.04	17,776.28			1,430.05
Other.....			8,050.36	220,706.13			63.43
Grand total collections.....			163,684.07	1,452,243.58			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 27.3 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 14.7 per cent of total accruals.

## WASHINGTON, OKANOGAN PROJECT

The Okanogan project is located in Okanogan County, Wash. The length of the irrigation season is 153 days, from May 1 to September 30. The average elevation of the project is 1,000 feet above sea level; the average rainfall is about 11.5 inches; the temperature ranges from 108° to -10° F. The soil is volcanic ash and gravel on the upper benches, and sand and gravel on the lowlands along the Okanogan River. The principal crop of the project is apples, with some peaches, pears, small fruits, hay, and vegetables. The principal markets are the States east.

*Operation and settlement data, Okanogan project*

Item	1920	1921	1922	1923	1924
Acreage for which the bureau was prepared to supply water.....	8,200	8,200	7,676	7,600	7,500
Acreage irrigated.....	5,436	5,644	5,569	5,162	4,940
Miles of canal operated.....	66	67	69	69	70
Water diverted (acre-feet) <sup>1</sup> .....	8,435	21,886	21,318	20,488	13,584
Water delivered to land (acre-feet).....	5,259	16,631	15,295	13,634	8,882
Per acre of land irrigated (acre-feet).....	0.96	2.95	2.75	2.64	1.80
Total number of farms on project.....	594	594	473	510	510
Population.....	1,137	1,220	1,363	1,430	1,261
Number of irrigated farms.....	1,890	439	447	458	453
Operated by owners or managers.....	1,340	388	390	399	404
Operated by tenants.....	50	51	57	59	49
Population.....	1,137	1,220	1,363	1,430	1,261
Number of towns.....	3	3	3	3	3
Population.....	1,885	2,150	2,300	2,600	3,000
Total population in towns and on farms.....	3,022	3,370	3,663	4,030	4,261
Number of public schools.....	5	6	6	7	7
Number of churches.....	8	8	8	8	9
Number of banks.....	5	5	5	5	4
Total capital stock.....	\$155,000	\$155,000	\$155,000	\$155,000	\$140,000
Amount of deposits.....	\$1,050,100	\$1,043,000	\$954,000	\$1,000,000	\$1,226,000
Number of depositors.....	2,100	2,200	2,250	2,350	2,400

<sup>1</sup> Corrected since last report.

*Appropriations*

<b>Fiscal year 1925:</b>		
Congressional authorizations.....		\$84,892.81
Disbursements.....	\$70,485.25	
Liabilities outstanding.....	8,572.97	
		79,058.22
Unencumbered balance June 30, 1925.....		5,834.59
<b>Fiscal year 1925: Amount specified in appropriations acts.....</b>		<b>70,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,912,228.42	\$47,767.18	\$1,960,995.60
Less collections.....	499,670.10		499,670.10
Net investment June 30, 1925.....	1,412,558.32	47,767.18	1,460,325.50

*Construction account*

	Fiscal year 1925	To June 30, 1925
<b>Cost of irrigation works:</b>		
Original construction.....		\$841,536.61
Supplemental construction.....	\$12,023.04	620,035.07
Total construction cost.....	12,023.04	\$1,461,571.68
Operation and maintenance prior to public notice (net).....		147,766.87
Operation and maintenance deficits and arrearages to be repaid with construction.....		9,746.79
Less construction revenues.....	189.93	1,423,551.60
Total to be repaid by water users.....	11,833.11	5,896.63
Contracted repayments:		
Water-right contracts (individuals).....		3,395.00
Contract: Okanogan irrigation district.....		1,494,445.29
		1,497,840.29

<sup>1</sup> Contra.



*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$65,112.33	\$452,677.50	\$65,868.77	\$477,762.60
Operation and maintenance returns:				
Contracted.....	47,077.87	358,970.36	47,744.37	358,970.36
Penalties.....	1,990.87	9,438.24	2,821.22	11,647.32
Discounts (contra).....	6.00	365.03	6.00	365.03
Miscellaneous revenues.....	566.45	68,119.83	410.40	68,490.83
Subtotals.....	49,629.19	436,163.40	50,969.99	438,742.48
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		9,746.79		9,746.79
Total.....	49,629.19	445,910.19	50,969.99	448,489.27
Results; deficit.....	15,483.14	6,767.40	14,928.78	29,272.42

*Status of current accounts receivable, June 30, 1925*

	Due		Collected				Uncol- lected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$14,617.37	\$81,661.45	\$1,076.25	\$64,814.40			\$16,847.05
Charges paid in advance.....			9.13	128.06			
Construction refunds.....				75.20			
Operation and maintenance:							
Water-right charges, project lands (6,725 acres).....	\$35,983.28	\$19,508.78	3,992.62	268,401.09	\$6.00	\$2,620.61	48,485.08
Penalties and interest.....	2,821.22	11,647.32	2,821.22	11,068.96		578.36	
Operation and maintenance refunds.....				52.50			
Miscellaneous:							
Rental of irrigation water....	370.00	109,614.48	437.60	106,680.29		2,394.19	370.00
Rentals, power and light.....		1,754.71		1,754.71			
Rentals, grazing and farming lands.....	84.00	856.50	84.00	856.50			
Construction forfeitures.....				97.50			
Construction penalties and interest.....	965.94	2,741.08	965.94	2,741.08			
Other.....			2,008.29	43,019.81			1,563.60
Grand total collections.....			11,376.79	499,670.10			

1 Actual construction accruals for year.....	\$17,208.07
Relief.....	2,590.70
Net.....	14,617.37
Actual operation and maintenance accruals for year.....	51,341.86
Relief.....	15,367.58
Net.....	35,983.28
2 Contra.....	

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 20.6 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1925, 15.2 per cent of total accruals.

## WASHINGTON, YAKIMA PROJECT

The Yakima project, comprising the Sunnyside, Tieton, Kittitas, Moxee, Roza, and Kennewick divisions, is located in Kittitas, Yakima, and Benton Counties, Wash. The irrigation season on the Sunnyside division extends from April 1 to October 31 (214 days), and on the Tieton from April 20 to September 30 (164 days). The water duty on the Sunnyside division is 3 acre-feet per acre, and on the Tieton division 2.4 acre-feet per acre. The soil is volcanic ash, sandy loam, and decomposed basalt. The principal products are alfalfa, apples, pears, peaches, grains, potatoes, sugar beets, hops, stock, and dairy products.

*Operation and settlement data, Sunnyside division, Yakima project*

	1920	1921	1922	1923	1924
Acreage for which bureau was prepared to supply water.....	109,733	101,509	101,339	101,329	102,356
Acreage irrigated.....	93,610	94,500	95,000	95,000	95,000
Number of farms irrigated.....	2,905	3,065	3,138	3,181	3,391
Miles of canal operated.....	605	605	605	605	605
Water diverted (acre-feet).....	417,523	440,348	421,950	432,953	446,160
Water delivered to land (acre-feet).....	284,800	309,709	301,838	313,800	321,495
Per acre of land irrigated (acre-feet).....	3.040	3.28	3.18	3.30	3.38
Total number of farms on project.....	2,905	3,065	3,138	3,181	3,391
Population.....	10,929	12,080	12,332	10,128	9,617
Number of irrigated farms.....	2,905	3,065	3,138	3,181	3,391
Operated by owners or managers.....	2,272	2,322	2,375	2,157	2,287
Operated by tenants.....	633	743	763	1,024	1,104
Population.....	10,929	12,080	12,332	10,128	9,617
Number of towns.....	13	11	11	11	11
Population.....	6,941	6,941	7,250	7,250	7,410
Total population of towns and farms.....	17,870	19,021	19,582	17,378	17,027
Number of public schools.....	40	41	41	41	41
Number of churches.....	30	30	30	30	30
Number of banks.....	13	13	12	12	10
Total capital stock.....	\$380,000	\$397,000	\$360,000	\$360,000	\$285,000
Amount of deposits.....	\$2,095,848	\$2,914,908	\$2,615,415	\$2,281,006	\$2,377,944
Total number of depositors.....	11,556	11,643	10,566	9,348	9,239

*Operation and settlement data, Tieton division, Yakima project*

	1920	1921	1922	1923	1924
Acreage for which bureau prepared to supply water.....	82,000	82,000	82,000	82,000	82,000
Acreage irrigated.....	28,000	28,500	28,700	28,550	27,970
Miles of canal operated.....	335	335	335	335	335
Water diverted (acre-feet).....	96,506	100,844	93,754	96,541	95,001
Water served to land (acre-feet).....	69,471	71,148	71,105	72,182	73,870
Per acre of land irrigated (acre-feet).....	2.47	2.50	2.48	2.55	2.64
Total number of farms on project.....	1,480	1,490	1,490	1,490	1,480
Population.....	3,314	3,457	3,542	3,453	3,480
Number of irrigated farms.....	1,340	1,300	1,300	1,305	1,300
Operated by owners or managers.....	1,048	1,010	965	875	850
Operated by tenants.....	292	290	335	430	450
Population.....	3,314	3,457	3,542	3,453	3,480
Number of towns.....	8	8	8	8	8
Population.....	23,000	23,000	23,000	23,000	23,000
Total population of towns and farms.....	26,314	26,457	26,542	26,453	26,480
Number of public schools.....	10	10	10	10	10
Number of churches.....	3	4	4	4	4

*Appropriations*

Fiscal year 1925:	
Congressional authorizations.....	\$1,417,699.97
Disbursements.....	\$853,957.19
Liabilities outstanding.....	35,692.76
	889,649.95
Unencumbered balance June 30, 1925.....	528,050.02
Fiscal year 1926: Amount specified in appropriation acts.....	295,000.00

<sup>1</sup> Pms unexpended balance of \$375,000 appropriation for Yakima-Kittitas, fiscal year 1925.

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$17,451,101.11	\$71,900.46	\$286,784.74	\$17,809,835.31
Less collections.....	7,262,887.20			7,262,887.20
Net investment June 30, 1925.....	10,188,213.91	71,900.46	286,784.74	10,546,909.11

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction.....	\$821,160.14	\$14,258,432.46
Supplemental construction.....	10,761.05	135,931.46
Value of works taken over.....	7,531.12	37,092.41
Total construction cost.....	839,452.31	14,431,456.33
Operation and maintenance prior to public notice (net).....		163,957.96
Operation and maintenance deficits and arrearages to be repaid with construction.....	124.34	77,238.54
Less:		
Contributed funds.....		68,736.50
Construction revenues.....	7,781.01	261,914.18
		325,060.68
Total to be repaid by water users.....	831,455.96	14,119,086.28
Contracted repayments, water-right contracts:		
Individuals.....	218.75	3,434,540.91
Warren Act.....	258,857.76	2,179,657.37
Irrigation districts.....	14,561.36	2,023,475.32
Special.....		2,279,600.00
Totals.....	249,015.15	9,917,303.60

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost.....	\$239,600.32	\$2,773,837.00	\$247,935.39	\$2,908,812.26
Operation and maintenance returns:				
Contracted.....	260,100.78	2,656,665.19	258,099.38	2,723,586.62
Penalties.....	1,996.09	39,770.34	6,365.36	44,826.98
Discounts (contra).....	4,214.99	32,929.20	3,825.15	35,373.44
Miscellaneous revenues.....	5,849.08	94,066.00	6,019.28	98,603.17
Subtotals.....	263,700.96	2,757,572.33	266,658.85	2,831,643.28
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	1194.90	77,113.00	124.34	77,238.54
Total.....	263,506.06	2,834,685.33	266,634.51	2,908,881.82
Results, excess.....	23,905.74	60,848.38	18,699.12	69.57

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water right charges	\$443,174.89	\$4,072,973.17	\$268,375.96	\$3,701,354.45	\$7,331.12	\$36,047.07	\$335,571.65
Contributed funds		63,736.50		63,736.50			
Total	443,174.89	4,136,709.67	268,375.96	3,765,090.95	7,331.12	36,047.07	335,571.65
Charges paid in advance			\$3,241.15	3,956.36			
Construction re-funds				2,833.62			
Operation and main- tenance:							
Water right charges, project lands (31,996 acres)	92,179.03	836,200.71	88,935.51	748,927.65	2,358.11	10,058.48	68,214.58
Warren Act lands (54,190 approximate acres)	28,788.29	203,811.21	25,512.89	191,180.44	12.96	22.38	12,608.39
Irrigation districts (67,419 approximate acres)	121,026.62	1,574,540.86	72,754.96	1,449,514.42	1,454.08	17,337.92	107,688.52
Other lands (84,611 approximate acres)	16,105.44	109,033.84	18,355.44	104,193.84			4,840.00
Total	258,099.39	2,723,586.62	205,558.80	2,493,816.35	3,825.15	36,418.78	193,351.49
Penalties and interest	6,365.36	44,826.93	5,958.13	44,419.70			407.23
Charges paid in advance			\$22.61	101.14			
Operation and maintenance re-funds				1,045.65			
Miscellaneous:							
Rentals of irrigation water	3,481.44	147,367.16	3,195.26	145,940.70			1,426.46
Rentals of power and light		3,635.33		3,635.33			
Rentals of grazing and farming lands	1,970.19	25,031.69	2,168.19	24,820.49			211.20
Construction forfeitures				1,067.62			
Penalties and interest	12,296.67	73,290.04	12,296.67	73,290.04			
Other			113,732.95	722,879.34			2,490.22
Grand total collections			608,022.20	7,282,887.29			

<sup>1</sup> Includes \$44,642.65 of accruals not due until July 1, 1925.<sup>2</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 8.2 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 7.1 per cent of total accruals.

## WYOMING, RIVERTON PROJECT

The Riverton project lies in Fremont County, Wyo., northeast of Wind River and west of the Big Horn River. The irrigation season is from May 1 to September 30. The average altitude is 5,200 feet; the average annual rainfall is about 8 inches; the average maximum temperature is about 95° F.; and the average minimum temperature -27° F. The soil is a heavy loam. The principal products are alfalfa, cereals, sugar beets, and potatoes; and the principal markets, Omaha, Denver, and local.

Settlement data, Riverton project <sup>1</sup>

Item	1920	1921	1922	1923	1924
Number of towns.....	2	2	2	2	2
Population.....	2,500	2,500	2,500	2,600	2,500
Number of public schools.....	2	2	2	2	2
Number of churches.....	7	7	7	7	7
Number of banks.....	5	5	5	5	5
Total capital stock.....	\$135,000	\$135,000	\$135,000	\$135,000	\$135,000
Amount of deposits.....	\$1,500,000	\$900,000	\$1,000,000	\$1,000,000	\$1,000,000
Number of depositors.....	2,600	2,200	2,200	2,800	2,800

<sup>1</sup> Project in process of construction, no water deliveries.<sup>2</sup> Estimated.

## Appropriations

<b>Fiscal year 1925:</b>		
Congressional authorizations.....		\$755,615.34
Disbursements.....		\$702,474.35
Liabilities outstanding.....		41,183.15
		763,657.60
Unencumbered balance June 30, 1925.....		11,967.84
<b>Fiscal year 1926:</b> Amount specified in appropriation acts.....		790,000.00

## Voucher transactions

	Reclamation fund	Wind River ceded lands (Indian)	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,539,918.55	\$359,176.04	\$45,271.80	\$2,944,366.19
Less collections.....	52,363.95			52,363.95
Net investment June 30, 1925.....	2,487,554.60	359,176.04	45,271.80	2,892,002.44

## Construction account

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works, original construction.....	\$694,242.30	\$2,374,232.17
Operation and maintenance prior to public notice (net).....	150.00	121.75
Less construction revenues.....	933.07	7,532.98
Total to be repaid by water users.....	590,159.23	2,366,821.40

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Miscellaneous:							
Rentals of irrigation water.....	\$150.00	\$261.75	\$150.00	\$261.75	-----	-----	-----
Rentals power and light.....	3,926.91	3,926.91	3,000.79	3,000.79	-----	-----	\$926.12
Other.....	-----	-----	15,284.69	49,101.41	-----	-----	\$61.55
Grand total collections.....	-----	-----	18,535.48	52,363.95	-----	-----	-----

**WYOMING, SHOSHONE PROJECT**

The Shoshone project is located principally in Park and Big Horn Counties, Wyo., with a small area in Carbon County, Mont. The annual rainfall for the Garland division has averaged 5.35 inches for the past 17 years, and for the Frannie division 4.90 inches over a period of 9 years. The average elevation of the project lands is about 4,500 feet above sea level. Temperature records over a period of 17 years for the Garland division show a mean maximum of 96.7° F. and a mean minimum of -23.9° F.; for the Frannie division temperature records over a period of 9 years show a mean maximum of 101° F. and a mean minimum of -29.9° F. The principal agricultural products on the developed part of the project are alfalfa, wheat, oats, potatoes, sugar beets, and beans. The principal markets are Billings and Butte, Mont.; Casper, Wyo.; Omaha, Nebr.; and Kansas City, Mo.

*Operation and settlement data, Shoshone project*

Item	1920	1921	1922	1923	1924
Acreage for which bureau is prepared to furnish water.....	65,890	65,826	71,223	70,350	63,240
Acreage irrigated.....	46,650	45,420	42,570	38,650	30,510
Miles of canal operated.....	458	460	457	452	450
Water diverted (acre-feet).....	187,329	221,419	192,851	176,198	175,873
Water delivered to land (acre-feet).....	113,065	112,524	99,170	91,062	89,036
Per acre of land irrigated (acre-feet).....	2.50	2.47	2.23	2.36	2.44
Total number of farms on project.....	1,009	1,005	1,083	1,071	1,071
Population.....	2,730	2,686	2,444	2,025	1,969
Number of irrigated farms.....	910	935	914	838	830
Operated by owners or managers.....	695	646	696	426	584
Operated by tenants.....	215	289	218	412	236
Population.....	2,730	2,686	2,444	2,025	1,969
Number of towns.....	5	5	5	5	5
Population.....	1,345	1,541	1,585	1,705	1,400
Total population of towns and farms.....	4,075	4,227	4,029	3,730	2,369
Number of public schools.....	12	7	7	7	7
Number of churches.....	8	8	8	8	8
Number of banks.....	5	5	4	3	3
Total capital stock.....	\$125,000	\$110,000	\$100,000	\$85,000	\$85,000
Amount of deposits.....	\$644,000	\$543,000	\$441,000	\$466,000	\$366,000
Number of depositors.....	2,605	2,400	2,400	2,300	1,473

<sup>1</sup> Does not include Powell National Bank salvage fund of \$85,000 nor its depositors.

*Appropriations*

<b>Fiscal year 1925:</b>		
Congressional authorizations.....	-----	\$526,436.21
Disbursements.....	\$240,402.81	-----
Liabilities outstanding.....	49,516.82	-----
Unencumbered balance June 30, 1925.....	-----	289,919.63
<b>Fiscal year 1926: Amount specified in appropriation acts.....</b>	-----	<b>414,000.00</b>

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*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers .....	\$9,705,684.22	\$322,164.67	\$164,135.50	\$10,191,984.39
Less collections .....	1,383,491.72			1,383,491.72
Net investment June 30, 1925 .....	8,322,192.50	322,164.67	164,135.50	8,808,492.67

*Construction account*

	Fiscal year 1925	To June 30, 1925
Cost of irrigation works:		
Original construction .....	\$154,974.49	\$7,578,987.59
Supplemental construction .....	101,823.99	1,649,890.25
Total construction cost .....	256,798.48	\$9,228,886.84
Operation and maintenance prior to public notice (net) .....		21,398.67
Operation and maintenance deficits and arrearages to be repaid with construction .....	44,759.28	44,907.03
		9,295,192.54
Less:		
Contributed funds .....	900.00	1,900.00
Construction revenues .....	7,691.92	83,700.41
		85,000.41
Total to be repaid by water users .....	262,965.84	9,300,592.13
Contracted repayments: Water-right contracts (individuals) ..	136,725.45	5,765,849.71

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1924	To Dec. 31, 1924	Fiscal year 1925	To June 30, 1925
Operation and maintenance cost .....	\$57,839.83	\$715,507.93	\$69,375.32	\$754,482.58
Operation and maintenance returns:				
Contracted .....	369.31	671,518.87	<sup>1</sup> 1,367.59	668,930.17
Penalties .....	1,308.66	10,584.38	1,201.62	11,379.93
Discounts (contra) .....	532.55	10,644.70	394.09	10,677.74
Miscellaneous revenues .....	8,467.91	23,150.22	8,204.42	23,396.64
Subtotals .....	9,363.33	694,608.77	7,704.36	698,019.00
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction .....	44,759.28	44,907.03	44,759.28	44,907.03
Total .....	54,122.61	739,515.80	52,463.64	742,926.03
Results:				
Excess .....		24,007.87		
Deficit .....	3,717.22		16,911.68	11,556.55

<sup>1</sup> Contra.

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Construction:							
Water-right charges.....	\$53,238.79	\$367,011.45	\$4,314.98	\$628,956.92	\$588.81	\$2,424.66	\$335,629.87
Contributed funds.....	900.00	1,900.00	900.00	1,900.00			
Total.....	54,138.79	368,911.45	5,214.98	630,856.92	588.81	2,424.66	335,629.87
Charges paid in advance.....			123.06	584.99			
Construction refunds.....			1,941.29	4,524.63			
Operation and maintenance:							
Water-right charges, project lands (62,644.38 acres).....	1,367.59	668,930.17	17,701.94	439,093.25	1,104.23	19,701.35	210,135.57
Penalties and interest.....	1,201.62	11,379.93	904.65	8,727.27	296.97	2,652.66	
Charges paid in advance.....			22.99	361.49	173.39	27.61	
Operation and maintenance refunds.....			669.45	1,078.90			
Miscellaneous:							
Rentals of irrigation water.....	7,779.17	25,427.69	7,650.53	25,159.00	55.92	55.92	212.77
Rentals, power and light.....	9,452.91	24,090.25	9,359.83	23,329.27	16.00	16.00	744.98
Rentals, grazing and farming lands.....	1,038.50	10,628.11	1,017.50	10,397.11			231.00
Construction forfeitures.....			3,070.98	9,881.28			
Construction penalties and interest.....	667.54	9,898.97	667.54	9,898.97			
Other.....			8,274.83	219,648.64			14,470.79
Grand total collections.....			56,478.45	1,383,491.72			

<sup>1</sup> Contra.    <sup>2</sup> Reduction due to relief and cancellations.    Actual accruals for year, \$51,779.09.

NOTE.—Uncollected construction water-right charges as of June 30, 1925, 34.7 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1925, 31.4 per cent of total accruals.



## SECONDARY INVESTIGATIONS

### ARIZONA

#### COLORADO RIVER (BOULDER CANYON RESERVOIR) INVESTIGATIONS

The bureau contributed \$1,300 to the upkeep and operation of the Bright Angel gaging station on the Colorado River, the balance of the cost of this work being met by the Federal Power Commission and the State of Arizona. The actual work is done by the Geological Survey.

### CALIFORNIA

#### SACRAMENTO VALLEY INVESTIGATIONS

*Iron Canyon project.*—The investigation was continued under the provisions of a contract dated January 26, 1924, between the United States; the Department of Public Works, Division of Engineering and Irrigation, of the State of California; and the Sacramento Valley Development Association. Of the \$10,000 made available for the investigation, \$5,000 was contributed by the United States, \$2,500 by the State, and \$2,500 by the association.

The project contemplates the irrigation of a gross area of 276,900 acres of land, all but 7,000 acres of which are located on the west side of Sacramento Valley between Red Bank Creek on the north and the Colusa-Yola County line on the south. Storage is to be provided in Iron Canyon Reservoir. The project differs from that described in the twentieth annual report in that the main canal would divert from the Sacramento River 6 miles below the reservoir, providing a better location along the foothills with the exclusion of considerable areas of lands of doubtful utility and also providing opportunity for the development of more power at the dam.

Preliminary location surveys were made of main canals to serve the project. Designs and estimates of all features were practically completed and the report was in course of preparation at the end of the fiscal year.

*Salt water barrier.*—Investigations of a barrier to prevent incursions of salt water into the delta region irrigated from the Sacramento River were continued under the provisions of a contract of January 26, 1924, between the United States; the Department of Public Works, Division of Engineering and Irrigation, of the State of California; and the Sacramento Valley Development Association, and two supplementary contracts dated June 26, 1924, and March 3, 1925, providing for a total of \$70,000 to be made available for the investigations; \$35,000 by the United States, \$27,500 by the State, and \$7,500 by the association. The East Bay utilities district has contributed \$600 additional. Total costs to the end of the fiscal year were about \$56,000.

Three dam sites are under investigation: The Army Point site, at the lower end of Suisun Bay; the Dillon Point site, in Carquinez Strait; and the Point San Pablo site, at the lower end of San Pablo Bay. The first two are alternative sites for a dam to make Suisun Bay fresh, while the latter would serve both San Pablo and Suisun Bays.

Drilling to develop foundation conditions was started on a two-shift basis beginning August 15, 1924. Field work at the Army Point and Dillon sites has been completed, that at the Point San Pablo site will probably be completed in July.

Operations were directed from Berkeley, Calif., where office work in connection with the preparation of designs and estimates was in progress throughout the year.

#### DEER-BUTTE CREEK (CHICO) INVESTIGATIONS

A cooperative contract by the United States and the Chico Chamber of Commerce, dated December 11, 1924, provided for an investigation of an irrigation development in Chico vicinity with waters from Butte Creek, Deer Creek, and Sacramento River; \$5,000 being made available by each party upon execution of the contract, with provision for additional amounts up to \$5,000 each.

Three reservoir sites on Butte Creek have been surveyed and superficially examined and a part of the distribution system surveyed. With the funds on hand it is planned to complete the survey of distribution systems from both creeks, to survey another reservoir site, and to prepare estimates of cost on the basis of such data.

The State of California in cooperation with the United States Department of Agriculture is conducting a soil survey of the lands proposed for irrigation.

### CALIFORNIA POWER INVESTIGATIONS

Previous work is described in the twenty-third annual report.

*North Fork Stanislaus River.*—Field examinations were made by the board in September, 1923. The study of this problem was carried to completion in November, 1924, and a report submitted on December 1, 1924.

The work assigned to the board was confined to the studies of the three streams selected and has thus been fully completed.

## COLORADO

### SAN LUIS VALLEY INVESTIGATIONS

Following a reconnaissance of the Rio Grande Basin down to and including the Rio Grande project, memorandum reports were prepared by engineers of the bureau bearing on progress in irrigation and drainage development since previous reports thereon.

In the early part of the year much activity was apparent in Colorado and New Mexico in the preparation of data to be used in formulating the interstate compact for division of Rio Grande waters, and much of these data was exchanged between the various parties collecting it.

Arrangements for investigations in San Luis Valley, in cooperation with the State of Colorado, for the purpose of outlining a policy of future development without interference with existing rights, were unsuccessful.

### SAN JUAN BASIN INVESTIGATIONS

*Pine River project.*—Field work in connection with this investigation was started in the summer of 1924, and report completed in March, 1925.

Diversion would be made from Pine River about 4 miles north of Bayfield and the main canal would run in a general westerly direction, crossing Florida River about 2 miles northwest of Florida and ending in a junction with the Florida Canal near Falfa; a branch of the main canal would run southerly near Oxford and with a lift of 103 feet cover lands along the north slope of Mesa Mountains. Storage would be provided at Bayfield site below the canal line to replace direct flow diverted to project lands and belonging to prior direct-flow rights. The project comprises 68,000 acres of lands now partially irrigated and 34,600 acres of new lands of which 6,800 acres would require pumping with power to be developed on the project. All irrigable lands are in private ownership, 19,730 acres being Indian allotments.

The topography and soils are generally excellent with little danger of alkali or drainage difficulties. Excellent crops of alfalfa, grains, vegetables, and hardy fruits are obtained on the partially irrigated and on adjacent lands. Local markets and transportation facilities are poor, the latter consisting of one narrow-gauge railroad. Construction costs are estimated at \$136 per acre for the new lands and from \$13 to \$30 per acre for lands now having a partial water supply.

There is little demand at this time for extension of the present irrigated area or for improvements in water supply for existing lands. The water rights on Pine River have not been adjudicated.

*La Plata Mesas project.*—A transmountain canal would divert waters of western tributaries of Animas River southerly from and including Hermosa Creek at an altitude of 7,500–8,000, passing through the Animas-La Plata Divide west of Durango. Such diversions, largely flood waters, together with a small unused surplus of waters in La Plata River drainage with the aid of storage at a number of proposed sites would by direct use and exchange be used to augment present supplies to partially irrigated and to dry lands on the mesas south of Hesperus. These lands are of the highest quality in soil and topography, though by climate restricted in their production to the hardier, staple crops. Funds for a detailed

investigation were not available, but a field reconnaissance and office studies of water supply indicated that the transmountain diversion is infeasible by reason of excessive cost and limited water supply. The most promising possibility appeared to be the construction of supplemental storage for some 20,000 acres of land now under irrigation. The best plan appears to be a reservoir of about 20,000 acre-feet capacity at the Long Hallow site to be supplied by a feed canal from La Plata River.

*Montezuma project.*—Previous investigations of this project are described in the eighteenth and twentieth annual reports. A reorganization of the financial structure of this project combined with gradual improvement of the status of the individual settlers has placed the project on its feet as a going concern. Barring unforeseen difficulties, the project is unlikely to revert to the conditions of 1919, when Government aid was requested. The present policy of improvement and extension to the limit of available water supply with the aid of reservoir sites within the irrigable area bids fair to accomplish the final development of possibly 75,000 acres, provided no bar arises to full diversion of Dolores River and provided Indian lands will be permitted to enter the project.

The extension of this project to an area of 75,000 acres will deplete the water supply of Dolores River to an extent that will make the development of the proposed Dolores project infeasible.

## IDAHO

### BOISE PROJECT EXTENSION, BLACK CANYON DIVISION

Considerable storage will be required ultimately for the full development of the Black Canyon division. The cheaper storage sites are individually of insufficient capacity for this purpose and as some storage is at present necessary to insure an adequate power supply from Black Canyon Dam for the use of the Gem irrigation district, investigations have been made for raising Little Payette Lake. Earlier plans contemplated a capacity exceeding 60,000 acre-feet, but recent testing of the ridge separating this lake from Big Payette Lake and of the gaps in the valley at the lower end make it advisable now to hold the capacity much lower. The present plan is to provide a total of 30,500 acre-feet capacity, of which 12,500 acre-feet would be for a local irrigation project without other feasible source for needed storage and 18,000 acre-feet for use of the Black Canyon division. Appropriation has been made sufficient for a capacity of 18,000 acre-feet, and construction will soon be started, provided further investigation of the site warrants. Construction to any capacity greater than 18,000 acre-feet will be contingent on the advance by beneficiaries of additional cost of such greater capacity.

## DUBOIS PROJECT

At the request of the Dubois Project Finance Association, investigation was undertaken for diversion of western tributaries of North Fork of Snake River above the Island Park Reservoir site to lands in the vicinity of Dubois. The results so far indicate a small area could be served at high cost. A similar project is described in the first and second annual reports. Final report on recent investigations is expected to be completed at an early date.

## MONTANA

### EASTERN AND NORTHERN TRIBUTARIES OF MILK RIVER

Article VI of the treaty of January 11, 1909, between the United States and Great Britain provides for the equal division of the waters of the St. Mary and Milk Rivers, and by order of October 4, 1921, by the International Joint Commission handling the interpretation of this treaty, the waters of the eastern tributaries of Milk River rising in Canada and flowing south to join the Milk River in Montana are to be divided equally between the two countries at the point where they cross the international boundary.

During the hearings before the International Joint Commission at St. Paul, Minn., in May, 1915, W. B. Sands, representing the Milk River Water Users' Associations, advanced the proposition that the flow of the individual streams might be more advantageously divided on an unequal basis, but still dividing the sum of their flows equally. In 1922, the Western Canada Irrigation Associa-

tion adopted a resolution suggesting that the International Joint Commission study the flow of these tributaries and arrange for a division along the lines suggested by Mr. Sands.

In furtherance of this plan, Canda has made extensive irrigable area surveys and collected stream flow data. No funds were available for this work in the United States until the passage of the reclamation appropriation for the fiscal year 1926, when the sum of \$10,000 was made immediately available.

The investigation of the streams was commenced early in June, 1925, but at the close of the fiscal year only preliminary data had been collected.

## NEW MEXICO

### PECOS RIVER INVESTIGATIONS

A hydrometric survey of the Pecos River above Carlsbad, N. Mex., is being made in cooperation with the State of New Mexico by contract dated May 18, 1925, providing for expenditures up to \$4,000 by the United States and \$2,000 by the State of New Mexico, principally in determination of stream losses. Earlier investigations, covered by report on Carlsbad project extensions, dated May, 1923, showed the desirability of building additional storage needed for the Carlsbad project on the upper Pecos River, rather than near the project and the Alamogordo site was selected as the most feasible. Objection has since been made to this plan because of the possibility of large losses in the river below the site. The object of the present investigation is to determine Pecos River losses as affecting the delivery of stored water from the proposed Alamogordo Reservoir to the Carlsbad project, particularly in the portion of the river between Fort Sumner and Acme, where very few discharge records are available because of the flashy, intermittent character of the run-off and the shifting, sandy stream-bed. Former gaging stations have been reestablished and new ones installed where necessary and conclusive data as to river losses will probably be obtained.

## NEW MEXICO-COLORADO

### SAN JUAN BASIN INVESTIGATIONS

A contract by the United States and the State of New Mexico for the investigation of irrigation possibilities in the San Juan Basin dated September 12, 1923, provided for expenditures of not to exceed \$10,000 by each party. Field work was begun in November, 1923.

*Animas project.*—Previous investigations of this project, then called the La Plata Valley project, will be found in the third and fourth annual reports of the bureau. The recent investigations were largely an effort to obtain a better route for the main canal from Animas River. The best location was found to be diversion just below Durango reaching La Plata River with a length of 45 miles, including 7 miles of tunnel and about 13 miles of lined canal and major structures. The rest of the canals would be expensive owing to numerous bad lands to be traversed and deep wide drainage channels to be crossed. An unusual length of canals would be required, as there are but 60,000 acres of irrigable lands in a gross area of nearly 300,000 acres lying north of San Juan River and westerly to the Ute Reservation. The irrigable area can be increased by 75,000 acres or up to the limit of available water supply by inclusion of Indian lands further west. In the easterly portion of the project the irrigable lands occur largely as glades between high rocky ridges; in the reservation large areas of undulating topography are found. The soils are generally deep, of shale and sandstone origin, with a sandy loam predominating and merging into heavy clays at the western end, where alkali is also evident. Marked slopes are prevalent and natural drainage channels would form the principal drains, but branch drains would in places be required owing to tight soil and alkali.

Primary storage would be provided on Animas River with a dam 2 miles above Durango. Secondary storage, for better control of canal operation and to reduce main canal capacities, would be provided at the Meadows site northwest of Farmington. The estimated cost of construction averages \$244 per acre if the project is limited to lands outside the Indian reservation, but would be reduced materially if Indian lands are included. Outside the reservation only about 10 per cent of the land is owned by the United States.

The conclusions reached in the report are that the small demand for irrigated land, the lack of local markets and adequate transportation, and the high construction cost will not warrant favorable consideration in the near future.

*Turley project.*—Earlier investigations of this project will be found described in the twentieth annual report, as the San Juan project. Soon after the investigation was started in the past fiscal year, it was found that the project unquestionably would be infeasible unless extended to include Indian lands within the Navajo Reservation. Request on the Indian Bureau for permission to carry the survey into the reservation was denied, and the investigation thereupon dropped.

## OKLAHOMA

### RECONNAISSANCE OF SOUTHWESTERN OKLAHOMA

At the request of Congressman James V. McClintic, a field examination and report reviewing all available data has been made of the following proposed projects in southwestern Oklahoma: The Lugert, Otter Creek, and Turkey Creek projects in Jackson County; the Navajo project in Kiowa, Jackson, and Tillman Counties; the Saddle Mountain project in Caddo and Kiowa Counties; and the Lawton project in Comanche County. A report was submitted in October and approved on December 1, 1924.

There are no public lands in any of the projects and practically all of the area embraced in them is now being farmed. The annual rainfall in this region averages approximately 30 inches, and in most years provides seasonable moisture for the production of good or fair crops. There is never a complete failure of all crops.

Available reservoir sites would provide storage for only a part of the land now in cultivation, and the recorded discharges of the streams depended upon to fill them do not cover a sufficient period of time to assure an adequate water supply during years of low precipitation.

If satisfactory arrangements can be made with the city of Lawton for the surplus storage in Lake Lawtonka, water for about 2,500 acres on the Lawton project would be available. For all of the other projects additional run-off records should be obtained before they are given further consideration.

Previous reports on all but the Saddle Mountain project will be found in the annual reports of the bureau for the years 1902 to 1907, inclusive, and for 1913 to 1917, inclusive.

## OREGON

### HARNEY PROJECT

Previous investigations of this project were covered by a report made in cooperation with the State of Oregon published in February, 1916. Since then the older lands, which were largely irrigated, have been formed into an irrigation district to provide supplemental storage. The district has expended large sums for engineering and organization, but so far has failed to obtain funds required for construction. An office review of more recent data has been prepared in Denver. A contract dated June 4, 1925, has been executed with the district providing for further investigations by the United States to determine feasibility of construction under the reclamation law; the United States to spend up to \$5,000, the district to furnish information and data, primarily obtained in previous work financed by the district.

## OREGON-WASHINGTON

### UMATILLA RAPIDS

The work described in the twenty-second and twenty-third annual reports was continued to completion and report made October 18, 1924.

The power dam for this project would be located 2 miles above Umatilla at the foot of rapids in the Columbia River. A wide range in water levels from low to high water and interference with existing railroads in any event make it advisable to construct the highest dam considered feasible with the view of utilizing excess power so made available. With such a height, the power head would vary from 29 to 58 feet and water would in extreme stages be backed up to Wallula, requiring the raising or removal of 33 miles of main-line railroad. This dam would produce a constant output of 420,000 horsepower except on rare occasions. Fluctuating power loads would require an installation of roughly twice this amount

and the total cost of dam and power plant including a navigation lock and including interest during an eight-year construction period is estimated at \$45,000,000. Production cost of power with the plant fully loaded, including interest at 4 per cent is estimated at 0.12 cent per kilowatt-hour.

At the power dam, water could be lifted 489 feet to cover 50,000 acres of agricultural lands on the Washington side down to Alderdale, lying behind the sand dunes bordering Columbia River. The construction cost for these lands would be \$116 per acre and operation and maintenance charges including power at 0.12 cent per kilowatt-hour, \$8.41 per acre annually. On the Oregon side, about 10 miles upstream from the dam, water could be lifted 486 feet to cover 6,000 acres lying above Cold Springs Reservoir at a construction cost of \$218 per acre and an annual operation charge of \$14.39 per acre. Water could also be lifted a total of 461 feet by three stages, one at the dam, one 2 miles south, and another 12 miles southwest of Umatilla with connecting canals for an area of 38,000 acres lying parallel to and 7 to 12 miles south of Columbia River, at a construction cost of \$249 per acre and an annual operation charge of \$11.19 per acre.

With regard to the irrigation construction the conclusions reached were that both construction and operation costs are too high to warrant further consideration at this time. The estimates indicate an attractive power possibility provided it is developed to its full capacity. The market for power for ordinary uses, is, however, too limited and the stability of electrochemical or electrometallurgical industries too insecure to furnish a basis of financing for this power development.

## TEXAS

### RED BLUFF RESERVOIR

Previous work will be found described in the twenty-second and twenty-third annual reports. In the past year, all records of diamond drilling and recent geologic reports were assembled in a report dated July, 1924. Local irrigation interests in Texas have made surveys of additional dam sites below the Texas-New Mexico State line, but no report thereon has been made available.

## UTAH

### CASTLE PEAK PROJECT

Previous arrangement for the collection of stream flow data in cooperation with the Geological Survey have been continued.

### GREAT SALT LAKE BASIN, CACHE VALLEY INVESTIGATION

This investigation was undertaken at the request of the Cache County Water Users' Association and conducted under cooperative contracts between the United States and the State of Utah. The irrigable lands are located in Cache County in northern Utah. In September, 1924, a preliminary report was made with the following conclusions and recommendations:

Conclusions: (1) Sufficient water is available in Cache Valley with storage at the Hyrum and Porcupine Reservoir sites, for the development of the Cache Valley project up to 60,110 acres of irrigable land; (2) the project is feasible from an engineering and construction standpoint, provided the result of recommended testing and geological examinations of the Hyrum Reservoir site is favorable; (3) The value of improved land with water right in the Cache Valley is from \$150 to \$300 per acre; (4) the lands proposed for development are of good quality and suitable for production of alfalfa, sugar beets, peas, wheat, etc.; (5) the construction of the Cache Valley project at a cost of approximately \$115 per acre for lands furnished a full water right and approximately \$75 per acre for lands furnished a late or supplementary water right, is within the benefits to accrue to the land, and the project is therefore considered feasible.

Recommendations: (1) That the necessary water filings be made for storage at the Porcupine and Hyrum Reservoir sites on the Little Bear River; (2) that the Hyrum Reservoir site be thoroughly tested and a geological report be obtained on the same with regard to the feasibility of its use as a storage reservoir; (3) that gaging stations be installed on the sources of water supply for the proposed project and a complete record be obtained in the future of their discharges; (4) that the problem of the water exchanges, which is the cornerstone of the proposed project, be very fully explained to the present users and their attitude

with reference to the same be obtained; (5) that a complete adjudication be made of the water rights in the proposed project; (6) that a district organization be formed of the lands in the proposed project.

#### GREAT SALT LAKE BASIN, PROVO RIVER INVESTIGATIONS

The investigations have been continued in cooperation with the State of Utah under the contract of January 3, 1922, and subsequent supplementary contracts, covering in general various investigations since that date made in the basin of Great Salt Lake.

In the fall of 1922, a brief reconnaissance was made of storage sites on Provo River, followed by a preliminary water supply study to determine their effectiveness. In 1923, six dam sites were mapped, river survey maps of the Geological Survey made in 1920 being used to estimate reservoir capacities. Early in 1924, the Bates dam site was tested by drilling, bed rock being found at depths generally less than 30 feet. Earlier surveys of the Deer Creek site were checked in 1924 for capacity and preliminary canal lines run from the outlet therefrom to carry water at high levels for lands west of Utah Lake. This route was found to be too costly. Surveys have been made for enlargement and extension of the Provo Reservoir and North Union Canals diverting northerly from Provo River at the mouth of Provo Canyon with a view of watering the higher lying lands northward to Salt Lake City and, by exchange of water rights, increase the irrigated areas at high levels under creeks crossing these canals and their extensions. Late in 1924, negotiations were started with the Utah Power & Light Co., having a power plant on Provo River below the Deer Creek Reservoir site, for the purpose of arranging a seasonal distribution of water supply better adapted to irrigation needs. At the end of the fiscal year drilling was in progress at the Deer Creek dam site. A progress report dealing with investigations to date and indicating the most feasible development on Provo River is expected to be made in the near future.

#### WASHINGTON

##### COLUMBIA BASIN INVESTIGATIONS

In August, 1924, the committee in charge of these investigations, consisting of Assistant Secretary F. M. Goodwin, the Commissioner of the Bureau of Reclamation, and the chief engineer of the bureau, appointed a board for the purpose of reviewing previous engineering reports and extending the investigations to cover agricultural, economic, and settlement features, consisting of Louis C. Hill of Los Angeles; Charles H. Locher of Hancock, Md.; Joseph Jacobs of Seattle, Wash.; Richard R. Lyman of Salt Lake City, Utah; Arthur J. Turner of Spokane, Wash.; and O. L. Waller of Pullman, Wash.

Report was rendered by this board in February, 1925, but has not yet been reviewed by the committee in charge.

The investigations were made under act of Congress of February 21, 1923, with appropriation of \$100,000 which fund was increased by \$10,000 through accretions to the reclamation fund. The lapsing date of the original appropriation, December 31, 1924, was by Senate Joint Resolution 157, approved December 22, 1924, extended to February 15, 1925.

#### WYOMING

##### NORTH PLATTE RIVER (CASPER) PUMPING PROJECT

An investigation of pumping possibilities for irrigation between Pathfinder Dam and Casper was started in September, 1924, and report made in December, 1924.

Four units having a total combined area of 9,514 acres were investigated and reported on. Three of these units are close to the city of Casper, and the fourth is 27 miles distant. The lifts range between 45 and 75 feet.

Sources of power for this pumping covered by the report include a power plant at Pathfinder Dam and the purchase of power from a steam-operated, public-utility plant at Casper. A number of tracts of a few acres each, devoted to intensive suburban farming, were found to be irrigated profitably by pumping at this time. A few tracts of alfalfa, irrigated largely by pumping with oil engines, were found to be operated at little profit generally. Work in sufficient

detail for estimates covered three units with a total area of 4,289 acres of first and second class irrigable land; with power obtained from Pathfinder, construction was estimated at \$147 per acre and annual operation and maintenance costs at \$13.76 per acre; with purchased power, costs were respectively \$99 for construction and \$16.20 annually for operation and maintenance.

The indicated annual costs of operation and maintenance for these areas are too high for feasibility with the general farming type of agriculture which would probably be the rule.

A cooperative contract was made on March 30, 1925, with the State of Wyoming for further investigations of the pumping possibilities along the North Platte River to cover all areas between the Pathfinder Dam and the Guernsey Reservoir which were not included in the previous report. The contract provides for expenditure of \$5,000 by the Bureau of Reclamation and \$5,000 by the State of Wyoming. Engineering work was started in the field on May 15 and this work was in progress at the close of the fiscal year. Soil classification will be made

### SARATOGA PROJECT

Engineering investigations and a preliminary land classification were covered by report made in July, 1922, following an investigation in cooperation with the State of Wyoming and described in the twenty-first annual report. An agreement with the State dated March 30, 1925, provides for investigation of the agricultural and economic features of the project, including a soil survey which is now in progress under the immediate direction of T. J. Dunnewald of the University of Wyoming, advised and assisted by personnel of the Bureau of Reclamation and of the Bureau of Soils, Department of Agriculture.

### EXPERIMENTAL INVESTIGATIONS

Since the establishment of the Bureau of Reclamation considerable experimental work has been in progress to determine hydraulic constants and coefficients to be used in designing irrigation structures. No new experimental work was started during the past fiscal year. Work previously started on inlet and outlet structure losses, and stresses in arch dams, was continued. The installation of the equipment at the Clear Creek arch dam on the Yakima project was completed, and a set of observations were made. These data have been submitted to the Engineering Foundation Committee on Arch Dams for analysis. Equipment for making stress and temperature measurements on the Gerber Dam was installed, and measurements will be begun in the near future.

Tests made in fiscal year 1924 on a model spillway at Bellevue, Colo., were analyzed and a paper prepared for publication in the Proceedings of the American Society of Civil Engineers.

Data previously collected have been analyzed and 14 experimental data cards prepared covering inlet and outlet losses, uplift under dams, corrosion of metal sheets in alkali soils, and discharge coefficients for control section weirs. These cards will be submitted for publication at any early date.

Material progress has been made in reports on canal losses, delivery to lands, project waste, reservoir losses, and consumptive use based largely on data obtained in the operation of Reclamation Bureau projects. A paper on evaporation records, covering observations on all stations operated on the projects has been completed. It will be supplemented by data and deductions bearing on the relation of reservoir evaporation to that observed from various kinds of pans in use.

Papers on design of intakes and outlets for irrigation structures, the movement of water under dams, and the transportation of silt in canals are in course of preparation to be submitted to a special committee of the American Society of Civil Engineers dealing with irrigation hydraulics.



## SECONDARY PROJECT INVESTIGATIONS

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$249,446.17
Disbursements.....	\$82,315.42	
Liabilities outstanding.....	132,753.60	
		<u>215,069.02</u>
Unencumbered balance, June 30, 1925.....		34,377.09
Fiscal year 1926: Amount specified in appropriation acts.....		<u>60,000.00</u>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,137,200.66	\$39,810.88	\$2,177,011.54
Less collections.....	655,929.97		655,929.97
Net investment, June 30, 1925.....	1,481,270.69	39,810.88	1,521,081.57

*Status of current accounts receivable as of June 30, 1925*

	Due		Collected				Un- collected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits		
			Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	
Miscellaneous:							
Contributed funds—							
Baker.....		\$5,000.00		\$5,000.00			
Other secondary inves- tigations.....	\$25,025.15	495,806.61	\$25,747.95	463,938.07			\$31,870.54
Rentals, grazing and farm- ing lands.....	11,895.27	174,922.26	12,465.44	132,003.79		\$42,497.67	420.80
Miscellaneous—							
Baker.....			1,879.29				
Other secondary inves- tigations.....			5,087.81	54,988.11			203.17
Grand total collec- tions.....			42,421.91	655,929.97			

<sup>1</sup> Contra.

## GENERAL INVESTIGATIONS, RECLAMATION SERVICE, 1923—DECEMBER 31, 1924

*Appropriations*

	General investigation fund, fiscal year 1924-25	Reclamation fund
Congressional authorizations.....	\$314,839.91	\$26,103.30
Less disbursements and liabilities outstanding.....	306,467.48	25,462.67
Unencumbered balance, June 30, 1925.....	8,472.43	640.63

*Voucher transactions*

	General investigation fund	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$301,496.81	\$25,184.53	\$5,115.61	\$331,796.95
Less collections.....	35,299.42	26,103.30	-----	61,402.72
Net investment, June 30, 1925.....	266,197.39	1918.77	5,115.61	270,304.23

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1925*

	Due		Collected cash	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
Contributed funds.....	\$2,814.63	\$28,314.63	\$2,814.63	\$28,314.63
Other.....	-----	-----	13,910.54	33,088.09
Grand total collections.....	-----	-----	16,725.17	61,402.72

*Cost of investigations and funds contributed for these investigations*

Features	Fiscal year 1925	To June 30, 1925	Contributed funds
Arizona-Nevada-Utah: Colorado River tributaries.....	<sup>1</sup> \$126.20	\$4,966.06	-----
California:			
Sacramento Valley, salt water barrier.....	22,031.35	24,182.41	\$8,103.30
Iron Canyon investigations.....	7,510.22	7,962.62	2,500.00
Colorado:			
Badito.....	<sup>1</sup> 20.63	585.74	-----
San Luis Valley.....	1,566.16	3,291.76	-----
Colorado-New Mexico: San Juan Basin.....	451.40	9,747.50	2,321.16
Idaho: Black Canyon.....	215.00	10,143.30	-----
Nebraska: Tri-County.....	-----	10,780.34	5,390.17
New Mexico: Estancia Valley.....	34.16	215.31	-----
New Mexico-Texas: Pecos Valley compact.....	1,475.70	4,524.37	-----
Oregon:			
Vale.....	826.40	5,792.06	-----
Owyhee.....	701.09	9,834.14	-----
Oregon-Washington: Umatilla Rapids.....	6,257.77	58,926.40	10,000.00
Texas: Red Bluff Reservoir.....	235.69	6,906.13	-----
Washington:			
Columbia Basin.....	29,230.09	96,879.18	-----
Yakima extensions.....	30,027.85	32,926.09	-----
Total.....	100,416.05	287,663.41	28,314.63

<sup>1</sup> Contra.

Statement of costs incurred on investigations made by the United States Bureau of  
to June

[References to engineers in charge and date of reports in the following statement refer to the most recent, tations each covered a relatively large general area containing a number of possible projects and the of accounts will not readily permit segregation of such joint costs]

State and project or investigation	Contractor	Date of agreement	Funds furnished under agreement		
			United States	Contractor	Total
<b>Arizona:</b>					
Hualpai Wells.....	State of Arizona.....	Apr. 19, 1916	\$1,623.63	*\$3,961.53	\$5,585.15
Gila River storage.....	do.....	Jan. 9, 1920	6,580.75	13,714.42	20,295.17
Parker.....	Noncooperative				
San Carlos.....	{San Carlos Irrigation Association.	June 4, 1920		8,638.54	8,638.54
Little Colorado.....	State of Arizona.....	July 1, 1920			
San Pedro.....	Noncooperative				
Paradise-Verde.....	do.....				
Colorado River diver-	Salt River Valley Water	Informal		929.14	929.14
sions.....	Users' Association.				
Colorado River tribu-	State of Arizona.....	do.....	1,957.23	(*)	*1,957.23
taries.....	Noncooperative				
<b>Arizona-California:</b>					
Boulder Canyon.....	{Imperial Irrigation district.	{Jan. 27, 1921			
	{Coachella Valley district.	{Dec. 29, 1921			
	{Palo Verde levee district.	{Dec. 14, 1920			
	{City of Los Angeles.....	{(Nov. 17, 1921	35,090.00	141,000.00	176,090.00
	{City of Pasadena.....	{Feb. 16, 1922			
	{Noncooperative	{May 31, 1922			
Colorado River Basin.....	Noncooperative				
<b>California:</b>					
Iron Canyon.....	Iron Canyon Association.....	Oct. 6, 1913	9,584.89	9,123.44	18,718.33
Do.....	Iron Canyon Association and State of California.	May 5, 1919	8,670.38	*18,087.67	26,758.05
Do.....	Sacramento Valley Development Association and State of California.	Jan. 26, 1924	5,462.62	* 4,127.00	9,589.62
Pit River.....	State of California.....	May 27, 1914	2,499.18	* 2,500.00	4,999.18
Lower Pit River.....	Northern California Irrigation Association.	Sept. 10, 1914	2,297.37	2,297.38	4,594.75
Warner reservoir.....	Volcan Land & Water Co.	July 12, 1920		5,378.35	5,378.35
Imperial Laguna.....	Imperial Laguna Water Co.	July 6, 1917		1,543.81	1,543.81
Imperial Valley.....	Imperial Irrigation district.	Aug. 28, 1920	13,008.90	20,009.06	33,018.65
Owens Valley.....	City of Los Angeles.....	Informal	12,061.92	* 14,016.99	26,078.91
Do.....	do.....	Apr. 29, 1920		18,232.01	18,232.01
Jess Valley.....	Modoc County Development Co.	Sept. 19, 1919	1,901.01	1,901.01	3,802.02
Honey Lake.....	Southern Lassen Irrigation Association.	Mar. 18, 1915	1,945.60	500.00	2,445.60
<b>Sacramento Valley—</b>					
Early investigations.....	Noncooperative				
Salt Water barrier.....	{Sacramento Valley Development Association.	{Jan. 26, 1924			
	{State of California.....	{June 26, 1924	24,846.84	* 24,673.95	49,520.79
	{do.....	{Mar. 3, 1925			
	{East Bay Mun. Ut. Dist.	{Sept. 19, 1924			
Kings River storage.....	Noncooperative				
Turlock-Modesto.....	do.....				
Oakdale - South San	do.....				
Joaquin.....	do.....				
Putah Creek.....	do.....				
San Joaquin.....	do.....				
San Luis Rey.....	do.....				
San Ysidro.....	do.....				
Woodbridge.....	do.....				
California power investigations.....	Federal Power Commission.	Informal.	3,057.62	* 581.98	* 3,639.60
<b>Stony Gorge Reservoir.</b>	Noncooperative				
Chico (Butte Deer Creek). California-Oregon:	Chico Chamber of Commerce.	Dec. 11, 1924	1,378.82	1,378.82	2,757.64
Shasta Valley.....	Klamath - Shasta Valley Irrigation District and State of California.	Oct. 26, 1921	5,000.00	* 40,877.92	45,877.92

*Reclamation with funds appropriated for secondary projects and general investigations 30, 1925*

though not necessarily most important investigation of the project in question. Some of the earlier invest-  
list therefor does not mention a large number of specific projects on which work was done. Condition

Additional expenditures by the United States not covered by agreement	Engineer in charge	Date of report	Remarks
	Schlecht.....	June 14, 1917.....	* 2,515.52 expended by State. Principally San Carlos storage.
	Fisher.....	Feb. 21, 1921.....	
\$517.91	Schlecht.....	Oct. 1, 1918.....	
24,829.51	Fisher.....	Feb. 21, 1921.....	See also Colorado River tributaries.
9,554.33	Pease.....	Sept. 28, 1920.....	
2,427.34	Evans.....	May 29, 1904.....	
	Hamlin.....	June 7, 1919.....	Arizona Engineering Commission. *No record of expenditures by other parties. Report covers Virgin, Little Colorado, and Williams Rivers.
	Mar. 3, 1920.....	Mar. 3, 1920.....	
	Preston.....	July 5, 1923.....	
4,966.06	Newell.....	Sept. 1923.....	
149,960.28	Young.....	March, 1924.....	Covers storage investigations of Lower Colorado River since 1918.
209,863.79	Whistler.....	1917.....	Covers investigation of storage possibilities and projects principally during 1914 to 1917 above Grand Canyon.
	do.....	November, 1914.....	* \$8,670.38 expended by State.
	Gault.....	May, 1920.....	
	Young.....		
			* \$1,627 expended by State. Work in progress.
	Peterson.....	April, 1915.....	* \$2,500 expended by State. Known as Shasta County project.
1,051.00	Means.....	July, 1915.....	
	Longwell.....	Feb. 28, 1920.....	Report under Kincaid Act. 1903, 1904 and 1905. * \$14,016.99 expended by State.
	Preston.....	Feb. 2, 1918.....	
2,794.04	Gault.....	January, 1921.....	
	Clausen-Means.....	November, 1904.....	
	Conkling.....	September, 1921.....	
3.72	Gault.....	July, 1920.....	
	Stubblefield.....	1916.....	Investigation not completed; contractor defaulted on requisite funds.
43,620.72	Harroun.....	1909.....	Covered numerous storage sites.
	Young.....		* \$16,570.65 expended by State. Work in progress.
1,157.70	Hill.....	Nov. 12, 1916.....	Pine Flat Reservoir.
278.97	Burch.....	Aug. 14, 1918.....	
1,079.16	do.....	August, 1918.....	
211.32	do.....	Aug. 14, 1918.....	Known as Dixon project. Report covered by U. S. Geological Survey Water-Supply Paper No. 222.
3,531.20	Mendenhall.....	1906.....	
608.53	Longwell.....	Feb. 28, 1923.....	See twentieth annual report.
7.50	Burch.....	Oct. 9, 1918.....	
180.47	Henny.....	Dec. 1, 1924.....	Federal Power Commission Board. * No report of expenditures by other parties other than contributed funds.
7,823.00	Burch.....	1918-19.....	
	Fisher.....		
			\$5,000 advanced by contractor. Work in progress.
	Gault.....	April, 1923.....	* \$9,228.78 expended by State.

*Statement of costs incurred on investigations made by the United States Bureau of  
to June*

[References to engineers in charge and date of reports in the following statement refer to the most recent, investigations each covered a relatively large general area containing a number of possible projects and the of accounts will not readily permit segregation of such joint costs]

State and project or investigation	Contractor	Date of agreement	Funds furnished under agreement		
			United States	Contractor	Total
<b>Colorado:</b>					
Badito.....	Noncooperative.....				
Dolores.....	do.....				
White River.....	do.....				
Little Snake River.....	do.....				
Montezuma.....	do.....				
San Luis Valley.....	do.....				
Upper White River.....	do.....				
San Juan Basin.....	do.....				
Lower White River.....	State of Utah.....	Sept. 1, 1923 June 1, 1923	\$6,615.25	\$6,615.25	\$13,230.50
<b>Idaho:</b>					
Miscellaneous.....	Noncooperative.....				
Island Park.....	do.....				
Mountain Home.....	Boise Chamber of Commerce.....	May 12, 1921	7,773.85	7,773.85	15,547.70
Swan Valley.....	Noncooperative.....				
Dubois.....	Dubois Project Finance Association.....	June 15, 1922	4,065.53	4,065.53	8,131.06
Port Neuf.....	Noncooperative.....				
General investigations.....	do.....				
Welser River storage.....	do.....				
Black Canyon.....	do.....				
Wood River.....	do.....				
Succor Creek.....	do.....				
Gooding.....	Big Wood Canal Co.....	June 16, 1925			
<b>Montana:</b>					
Clarks Fork.....	Noncooperative.....				
Crow Reservation.....	do.....				
Judith Basin.....	Thos. Nicholson et al.....	Aug. 20, 1919		2,891.42	2,891.42
Lake Basin.....	Noncooperative.....				
Bitter Root.....	do.....				
Madison river.....	do.....				
Marias.....	do.....				
Missoula-Huson.....	do.....				
Toston.....	do.....				
Kalispell.....	Kalispell Chamber of Commerce.....	Apr. 30, 1920		73.29	73.29
Tally Lake.....	Tally Lake Irrigation district.....	Nov. 28, 1919		2,544.21	2,544.21
Cut Bank.....	Cut Bank Irrigation district.....	June 13, 1921		1,863.01	1,863.01
Camas.....	Farmers Development Association.....	Sept. 28, 1921		100.00	100.00
Blackfeet water supply.....	Toole County Irrigation district.....	Aug. 22, 1923		986.75	986.75
Milk River tributaries.....	Noncooperative.....				
<b>Montana-North Dakota:</b>					
Miscellaneous investigations.....	do.....				
<b>Nebraska:</b>					
Tri-County.....	Central Nebraska Supplemental Water Association.....	Aug. 1, 1923 <sup>1</sup>	5,390.17	10,390.17	15,780.34
South Platte.....	Noncooperative.....				
Lower Platte.....	Lower Platte Irrigation Association.....	Aug. 24, 1921	8,444.61	15,400.00	23,844.61
<b>Nevada:</b>					
Humboldt River.....	State of Nevada.....	June 30, 1919	722.55	* 1,000.00	1,722.55
Walker River.....	Noncooperative.....				
Upper Owyhee.....	State of Nevada.....	Sept. 1, 1921		292.06	292.06
<b>New Mexico:</b>					
San Juan Basin.....	State of New Mexico.....	Sept. 12, 1923	7,426.34	* 7,426.33	14,852.67
Estancia Valley.....	do.....	Aug. 28, 1923	215.31	430.62	645.93
Middle Rio Grande.....	do.....	Jan. 2, 1920	4,130.07	* 4,915.21	9,045.28
Do.....	Rio Grande survey commission.....	Mar. 31, 1922		5,766.45	5,766.45

*Reclamation with funds appropriated for secondary projects and general investigations 90, 1925—Continued*

though not necessarily most important investigation of the project in question. Some of the earlier investigator therefor does not mention a large number of specific projects on which work was done. Condition

Additional expenditures by the United States not covered by agreement	Engineer in charge	Date of report	Remarks
\$585.74 Pease.....	Pease.....	January, 1924....	
4,256.27 Burkart.....	Burkart.....	1919.....	See also San Juan Basin investigations by Fisher.
4,457.00 Stockton.....	Stockton.....	1904.....	See also Colorado River compilation by Whistler and Upper White River by Green.
951.43 Burkhardt.....	Burkhardt.....	1918.....	
4,918.10 do.....	do.....	1919.....	See San Juan Basin investigations by Fisher.
7,609.77 Debler-Walker.....	Debler-Walker.....	Aug. 12, 1924....	
6,282.27 Green.....	Green.....	June, 1924.....	Known also as Yellowjacket project.
6,307.61 Fisher.....	Fisher.....	March, 1925.....	Pine River, La Plata Mesas, and Montezuma projects.
	Green.....	March, 1924....	Known also as Deadman Bench project.
1,327.25 Wiley.....	Wiley.....	Apr. 12, 1918....	
4,774.53 Banks-Dibble.....	Banks-Dibble.....	1918-19.....	See also Dubois project.
5,978.57 Banks-Debler.....	Banks-Debler.....	Sept. 13, 1923....	
544.88 Gay.....	Gay.....	Jan. 12, 1909....	
26,457.54 Banks.....	Banks.....		Work in progress.
2,168.01 Hogue.....	Hogue.....	Nov. 4, 1908....	
1,191.78 do.....	do.....		
918.96 Wiley.....	Wiley.....	Dec. 21, 1918....	
11,871.43 Bond.....	Bond.....		Reported in Boise project histories.
168.95 Newell.....	Newell.....	1904.....	
2,392.67 Stockton.....	Stockton.....	1904.....	See also Owyhee project.
	Gault.....		\$1,000 advanced by contractor. Work not yet inaugurated.
9,248.18 Ward.....	Ward.....	Nov. 5, 1921....	
15,911.96 Stockton.....	Stockton.....	Nov. 16, 1907....	
	Fisher.....	November, 1919..	
7,408.26 Stratton.....	Stratton.....	April, 1906.....	
2,719.64 Morris.....	Morris.....	Nov. 12, 1920....	
10,729.09 Stratton.....	Stratton.....	Apr. 28, 1906....	See also report by Crowe on Toston project, Oct. 10, 1919.
13,546.29 Babb.....	Babb.....	1905.....	
3,086.33 Crowe.....	Crowe.....	Jan. 20, 1920....	
544.58 do.....	do.....	Oct. 10, 1919....	
	Moody.....	None.....	
	do.....	Oct. 20, 1920....	
	Snell.....	1921.....	
	Moody.....	Oct. 8, 1921....	
	Debler.....	June, 1924.....	
463.74 Crocker.....	Crocker.....		Work in progress.
2,296.90			Miscellaneous early investigations.
2,381.70 Smith.....	Smith.....	May, 1924.....	
2,877.01 Pease.....	Pease.....	1903.....	
	Smith.....	Mar. 9, 1923....	Project now known as North Sterling Irrigation district.
	Conkling.....	December, 1919..	* \$1,000 expended by State.
13,696.37 Stevens.....	Stevens.....	June, 1915.....	
	Conkling.....	September, 1921..	
	Fisher.....	August, 1924....	Animas and Turley projects. * \$5,105.17 expended by State.
	do.....	None.....	Work stopped at request of State. * \$430.62 expended by State.
	Burkholder.....	None.....	Work performed by the State. * 4,915.21 expended by State.
	Gault.....	March, 1923....	
28,064.33 Hinderlider.....	Hinderlider.....	1905.....	See also San Juan Basin investigations by Fisher called Animas project.

# 120 ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

## Statement of costs incurred on investigations made by the United States Bureau of to June

[References to engineers in charge and date of reports in the following statement refer to the most recent, tifications each covered a relatively large general area containing a number of possible projects and the of accounts will not readily permit segregation of such joint costs]

State and project or investigation	Contractor	Date of agreement	Funds furnished under agreement		
			United States	Contractor	Total
<b>New Mexico—Con.</b>					
La Plata.....	Noncooperative.....	.....	.....	.....	.....
Las Vegas.....	do.....	.....	.....	.....	.....
Urton Lake.....	do.....	.....	.....	.....	.....
Penasco.....	do.....	.....	.....	.....	.....
Pecos Valley.....	Pecos Water Users' Association.....	Sept. 22, 1920	\$5,700.00	\$5,700.00	\$11,400.00
Do.....	Pecos Water Users' Association and State of New Mexico.....	May 2, 1921 May 18, 1925	344.30	* 319.18	663.48
<b>North Dakota:</b>					
Bismark.....	Noncooperative.....	.....	.....	.....	.....
Bowman.....	do.....	.....	.....	.....	.....
Little Missouri.....	do.....	.....	.....	.....	.....
Washburn.....	do.....	.....	.....	.....	.....
Nesson.....	do.....	.....	.....	.....	.....
<b>Oklahoma:</b>					
Lawton.....	do.....	.....	.....	.....	.....
Turkey Creek.....	do.....	.....	.....	.....	.....
Cimarron.....	do.....	.....	.....	.....	.....
General reconnaissance.....	do.....	.....	.....	.....	.....
Red River.....	do.....	.....	.....	.....	.....
<b>Oregon:</b>					
Central Oregon.....	do.....	.....	.....	.....	.....
Columbia River.....	State of Oregon.....	Dec. 12, 1913	17,008.51	* 14,976.18	31,984.69
John Day.....	do.....	May 5, 1913	16,009.57	* 13,179.61	29,189.18
Deechutes.....	do.....	do.....	15,862.85	* 18,504.40	34,367.25
Do.....	do.....	May 23, 1919	7,080.30	* 5,506.09	12,586.39
Do.....	1921-22 noncooperative.....	.....	.....	.....	.....
Harney.....	State of Oregon.....	May 5, 1913	1,046.62	* 646.98	1,693.60
Do.....	Harney Valley irrigation district.....	June 4, 1925	.....	.....	.....
Malheur (Vale).....	State and Warm Springs irrigation district.....	May 5, 1913	4,982.10	* 5,218.07	10,200.17
Do.....	State of Oregon and Warm Springs irrigation district.....	Aug. 26, 1922	2,110.89	5,000.00	7,110.89
Do.....	1924-25 noncooperative.....	.....	.....	.....	.....
Ochoco Crooked River.....	State of Oregon.....	May 5, 1913	3,570.30	* 4,241.25	7,811.55
Owyhee.....	do.....	do.....	1,615.74	* 1,197.06	2,812.80
Do.....	do.....	May 17, 1921	4,354.61	4,354.61	8,709.22
Do.....	1924-25 noncooperative.....	.....	.....	.....	.....
Rogue River.....	State of Oregon.....	May 5, 1913	1,426.96	* 1,844.93	3,271.89
Silver Lake.....	do.....	do.....	3,407.03	* 3,017.46	6,424.49
Silver Creek.....	do.....	do.....	334.23	.....	334.23
Warner Valley.....	do.....	do.....	1,181.85	* 1,434.92	2,616.77
White River.....	do.....	do.....	97.03	* 397.40	494.43
Willamette Valley.....	do.....	do.....	378.20	* 1,036.55	1,414.75
Klamath River.....	Noncooperative.....	.....	.....	.....	.....
Teal District.....	do.....	.....	.....	.....	.....

*Reclamation with funds appropriated for secondary projects and general investigations 50, 1925—Continued*

though not necessarily most important investigation of the project in question. Some of the earlier investor list therefor does not mention a large number of specific projects on which work was done. Condition

Additional expenditures by the United States not covered by agreement	Engineer in charge	Date of report	Remarks
\$5,014.09 17,464.70 5,798.18 1,306.49	Reed..... do..... Teeter..... Bonstedt-Debler Elder.....	Oct. 24, 1904..... Apr. 20, 1905..... June, 1924..... May, 1923.....	See also report by Fogg, Pecos River Survey, 1914. Do.  Work in progress. State contracted to expend \$2,000. * \$319.18 expended by State.
13,621.60 4,025.08 11,983.52 10,532.78 17,471.58	Churchill..... Stebbins..... Stockton..... Stratton..... Churchill.....	Sept. 22, 1906..... Jan. 7, 1909..... Oct. 14, 1909..... May 8, 1909..... July 19, 1905.....	
13,774.82 137.20 8,691.17 1,537.37 60,206.27	Pease..... do..... Schlecht..... Pease..... Camp.....	July 26, 1916..... July, 1915..... 1905..... October, 1924..... 1905.....	See also report on Oklahoma general reconnaissance by Pease. Do.  Covers Red River and Turkey Creek projects. See also report on Oklahoma general reconnaissance by Pease.
30,126.82	Jacobs..... Harza.....	March, 1909..... November, 1914.....	Early work on large number of projects. Power development at Dalles. * \$14,976.18 expended by State.
	Whistler..... do.....	February, 1916..... December, 1914.....	Oregon cooperative reports. * \$13,179.61 expended by State. See also report by Fisher. * \$18,504.40 expended by State.
	Crosby.....	November, 1920, and Feb. 28, 1921.	Geological examinations. * \$5,506.00 expended by State.
8,360.96 58.06	Fisher..... Whistler.....	April, 1922..... February, 1916.....	Includes board report for Federal Power Commission. Oregon cooperative reports. * \$646.98 expended by State. Work not yet started.
82,730.67	Whistler.....	February, 1916.....	Oregon cooperative reports. * \$4,467.12 expended by State. \$750.95 of United States expenditures subsequently repaid by Warm Springs irrigation district.
	Bond.....	January, 1923.....	
8,129.92	do..... Whistler.....	1924..... June, 1915.....	\$4,307.09 was repaid by the Ochoco irrigation district (Oregon cooperative reports). * \$4,241.25 expended by State.
	do.....	February, 1916.....	Oregon cooperative reports. See also reports by Bond. * \$1,197.06 expended by State.
1,267.29 27,706.26	Bond..... do..... Whistler.....	November, 1921..... January, 1925..... February, 1916.....	\$942.07 of United States expenditures subsequently repaid by Eagle Point and Talent irrigation districts. Oregon cooperative reports. * \$1,844.93 expended by State.
	do.....	October, 1915.....	\$775.91 of United States expenditures subsequently repaid by Summer Lake and Silver Lake irrigation districts. Oregon cooperative reports. * \$3,017.46 expended by State.
	do.....	February, 1916.....	Oregon cooperative reports.
	do.....	do.....	Oregon cooperative reports. * \$1,434.92 expended by State.
	do.....	do.....	Oregon cooperative reports. * \$397.40 expended by State.
	do.....	do.....	Oregon cooperative reports. * \$1,036.55 expended by State.
347.39 456.35	Newell, Henny-Wiley.	Sept. 14, 1917.....	



*Statement of costs incurred on investigations made by the United States Bureau of Reclamation to June*

[References to engineers in charge and date of reports in the following statement refer to the most recent investigations each covered a relatively large general area containing a number of possible projects and the of accounts will not readily permit segregation of such joint costs]

State and project or investigation	Contractor	Date of agreement	Funds furnished under agreement		
			United States	Contractor	Total
Oregon—Continued.					
General reconnaissance.	Noncooperative.				
Furnish system.	do.				
McKay Creek.	do.				
Lower Klamath Lake.	do.				
Umatilla Rapids.	State of Oregon.	Apr. 15, 1924	\$48,926.40	\$10,900.00	\$58,926.40
South Dakota:					
Angostura.	State of South Dakota.	May 31, 1917	3,831.70	3,542.61	6,874.31
Texas:					
Cotulla.	Noncooperative.				
Lower Rio Grande.	Lower Rio Grande Conserv. Association.	Feb. 25, 1919	15,837.37	15,394.44	31,231.81
Do.	Cameron and Hidalgo Counties improvement districts.	July 6, 1922		5,506.79	5,506.79
Do.	Lower Rio Grande Valley Chamber of Commerce.	Nov. 29, 1920		12,543.12	12,543.12
Do.	Lower Rio Grande Valley Water Users' Association.	Informal, Sept., 1921		588.40	588.40
Red Bluff Reservoir.	Pecos Valley Water Users' Association.	Oct. 25, 1921		5,500.00	5,500.00
Pecos River survey.	Noncooperative.				
Pecos compact.	States of New Mexico and Texas.	Informal.	4,524.37	(*)	*4,524.37
Utah:					
Castle Peak.	State of Utah and Mormon Church.	Mar. 11, 1918	990.45	990.45	1,980.90
Dixie.	Noncooperative.				
General reconnaissance.	do.				
Mammoth reservoir (Rice River).	do.				
Price River.	do.				
Green River water right investigation.	do.				
Bear Lake.	do.				
Provo-Weber.	do.				
Utah Lake.	do.				
Juab County.	T. C. Winn, et al.	June 10, 1919		4,196.68	4,196.68
Green River.	Salt Lake Chamber of Commerce.	May 27, 1921	5,247.00	5,247.00	10,494.18
Salt Lake Basin.	State of Utah.	Jan. 3, 1922 June 1, 1923 Nov. 30, 1923 July 31, 1924 Apr. 30, 1925	41,773.04	40,773.04	82,546.08
Cache Valley.	do.	June 1, 1923	4,244.47	4,244.48	8,488.95
Transmountain diversions.	Noncooperative.				
Spanish Fork—Lehi drainage.	do.				
Washington:					
Benton.	do.				
Columbia Basin.	do.				
Kittitas.	Kittitas irrigation district.	July 5, 1921		1,000.00	1,000.00
Lower Snake River.	State of Washington.	Jan. 22, 1920	2,099.49	* 2,000.00	4,099.49
Methow-Okanogan.	Noncooperative.				
Palouse.	do.				
Do.	State of Washington.	Nov. 18, 1913	10,201.92	* 9,999.70	20,201.62
Wapato.	Noncooperative.				
Priest Rapids.	do.				
Columbia River Power.	Federal Power Commission.	Informal.	4,042.95	(*)	4,042.95
Snake and Columbia Rivers.	Noncooperative.				

*Reclamation with funds appropriated for secondary projects and general investigations 30, 1925—Continued*

though not necessarily most important investigation of the project in question. Some of the earlier investigator therefore does not mention a large number of specific projects on which work was done. Condition

Additional expenditures by the United States not covered by agreement	Engineer in charge	Date of report	Remarks
\$226.43 522.49 7,235.29	Wiley Harper Crocker	1918 June 18, 1924 June 2, 1925	Utilization of McKay storage. Utilization of McKay storage. Report covers engineering only, work still in progress.
21.48	Shaw Crocker	1923-24	Work in progress. Horse Heaven project.
	Pease	1917-18	
110.00 1,367.00	Parkhill Pease	March, 1919 1921	Covers irrigation development.
	do	October, 1921	
	Pease-Teeter	1923	Covers flood control.
	Pease	1923	
6,906.18 7,120.71	Teeter-Lee Fogg Pease	1924 1914 February, 1925	* Expenditures by other parties not known.
22,921.23	Drager	December, 1920	
863.52	Lytel	Oct. 2, 1918	See also Colorado River tributaries, Arizona, Nevada, Utah, by Newell, September, 1923.
632.59	do	1919	
494.27	do	Aug. 15, 1917	
145.40 252.74	Walter Lytel	Apr. 5, 1923 1918-19	
18,827.72 141.35 24,049.30	Swendsen Lytel Swendsen	Oct. 11, 1906 1918-19 Mar. 31, 1906	See Salt Lake Basin report by Green for investigations, 1921-1925.
	Lytel Green	February, 1920 December, 1921	
	do		\$50,640.27 advanced by contractor. Work in progress.
	do	September, 1924	
3,555.02	Carroll	November, 1923	
500.91	Green	May, 1923	
11,167.45 102,566.20 100,082.73	Noble Gault do Rowe	1905 February, 1925 March, 1925 December, 1920, and Feb. 16, 1921	Also called Ledbetter and Hanford projects. Includes \$48,789.74 carried on Yakima project accounts. Use of water investigations. * \$2,000 expended by State.
192.14 76,409.01	Henny Anderson McCulloh	Jan. 15, 1920 Dec. 26, 1904 Jan. 7, 1915	See also Columbia Basin reports. See also Columbia Basin reports. * \$9,999.70 expended by State.
36,465.77 6,216.01	Noble Charles Henny	December, 1906 Feb. 24, 1905 June 30, 1922	Part of Yakima projects. See also Columbia Basin reports. * Expenditures by others unknown.
82.81			Miscellaneous expenses.

*Statement of costs incurred on investigations made by the United States Bureau of  
to June*

[References to engineers in charge and date of reports in the following statement refer to the most recent, investigations each covered a relatively large general area containing a number of possible projects and the of accounts will not readily permit segregation of such joint costs]

State and project or investigation	Contractor	Date of agreement	Funds furnished under agreement		
			United States	Contractor	Total
Wyoming:					
Church Butte.....	Noncooperative.....	.....	.....	.....	.....
De Smet.....	do.....	.....	.....	.....	.....
Fifteen Mile.....	do.....	.....	.....	.....	.....
Green River.....	do.....	.....	.....	.....	.....
Lyman.....	do.....	.....	.....	.....	.....
North Platte River.....	State of Wyoming.....	{Jan. 15, 1918 Sept. 23, 1920	\$5,868.66	* \$5,868.66	\$11,737.32
Green River Basin.....	do.....	June 1, 1915	3,681.76	* 3,700.52	7,382.28
Encampment.....	do.....	Apr. 29, 1921	4,883.61	* 4,920.76	9,804.37
Saratoga.....	do.....	.....	.....	.....	.....
Do.....	do.....	Mar. 30, 1925	.....	.....	.....
Alcoya-Casper.....	do.....	June 20, 1921	4,809.77	* 10,616.76	15,426.53
Pathfinder pumping...	Noncooperative.....	.....	.....	.....	.....
North Platte River pumping.	State of Wyoming.....	Mar. 30, 1925	836.93	* 1,062.09	1,919.02
Casper pumping.....	Noncooperative.....	.....	.....	.....	.....
General reconnaissance.	do.....	.....	.....	.....	.....
Miscellaneous:					
General reconnaissance.	do.....	.....	.....	.....	.....
Miscellaneous investigations.	do.....	.....	.....	.....	.....
Preliminary investigations.	do.....	.....	.....	.....	.....
Experimental investigations.	do.....	.....	.....	.....	.....
Grand total.....	.....	.....	429,440.59	* 646,257.16	* 1,075,697.75

<sup>1</sup> Senate Joint Resolution, No. 215.

<sup>2</sup> Includes \$175,517.94 expended directly by States.

<sup>3</sup> Includes \$48,789.74 carried in Yakima project accounts.

*Reclamation with funds appropriated for secondary projects and general investigations 30, 1925—Continued*

though not necessarily most important investigation of the project in question. Some of the earlier investigator therefor does not mention a large number of specific projects on which work was done. Condition

Additional expenditures by the United States not covered by agreement	Engineer in charge	Date of report	Remarks
\$1,442.28	Pease.....	July, 1918.....	See also Green River Basin report by Stubblefield.  Do. {Covers entire North Platte drainage area. * \$5,868.66 expended by State. Wyoming cooperative investigations. * \$3,700.52 expended by State. Also known as Big Creek project. Also known as Pass Creek Flats project. * \$4,920.76 expended by State. Also known as Pass Creek Flats project. Work in progress. * \$10,616.76 expended by State. See also Casper and North Platte pumping by Smith. Work in progress. Also known as Pathfinder pumping and as Casper pumping projects. * \$1,062.09 expended by State.
8,917.38	Schlecht.....	May 25, 1906.....	
125.06	Sanford.....	June 24, 1919.....	
320.15	Pease.....	July, 1918.....	
2,477.77	Stubblefield.....	March, 1919.....	
	Conkling.....	Sept. 4, 1920.....	
	Richardson.....	January and October, 1916.	
	Bonstedt.....	July, 1922.....	
	Dunnewald.....		
	Gault.....	February, 1922.....	
1,568.96	Fritsch.....	Feb. 17, 1916.....	
	Smith.....		
2,877.99	do.....	December, 1924.....	
2,073.34	do.....		
6,182.31	Various.....	Various.....	
9,720.99	do.....	do.....	
80,488.73	do.....	do.....	
20,540.22	do.....	do.....	
1,606,750.57			

## BAKER PROJECT, OREGON

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$496,341.82
Disbursements.....	\$2,554.55	
Liabilities outstanding.....	357.45	
		<u>2,912.00</u>
Unencumbered balance, June 30, 1925.....		493,429.52

Fiscal year 1926: Amount specified in appropriation acts (Unexpended balance, fiscal year 1925 appropriation).

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$57,758.64	\$1,442.19	\$59,200.83
Less collections.....	879.29		879.29
Net investment, June 30, 1925.....	56,879.35	1,442.19	58,321.54

*Cost of investigations*

	Fiscal year, 1926	To June 30, 1925
Cost of investigations.....	\$2,911.00	\$90,856.45
Less contributed funds.....		5,000.00
Net cost.....	2,911.00	55,856.45

## OWYHEE PROJECT, OREGON

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$316,002.00
Disbursements.....	\$4,446.47	
Liabilities outstanding.....	12.98	
		<u>4,459.37</u>
Unencumbered balance, June 30, 1925.....		211,543.63

Fiscal year 1926: Amount specified in appropriation acts (Unexpended balance, fiscal year 1925 appropriation).

*Voucher transactions*

Disbursements and net transfers, reclamation fund.....	\$4,407.10
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*Cost of investigations*

Cost of investigations <sup>1</sup> .....	\$3,703.04
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## SALT LAKE BASIN PROJECT, UTAH

*Appropriations*

Fiscal year 1925:		
Congressional authorizations.....		\$376,000.00
Disbursements.....	\$7,576.46	
Liabilities outstanding.....	1,652.89	
		<u>9,229.35</u>
Unencumbered balance, June 30, 1925.....		366,770.66

Fiscal year 1926: Amount specified in appropriation acts (Unexpended balance, fiscal year 1925 appropriated).

*Voucher transactions*

Disbursements and net transfers, reclamation fund.....	\$8,857.22
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*Cost of investigations*

Cost of investigations <sup>1</sup> .....	\$9,423.79
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ELWOOD MEAD,  
Commissioner of Reclamation.

<sup>1</sup> For other costs, see report for secondary projects.

# APPENDIX

## CONSOLIDATED FINANCIAL DATA

TABLE 1.—Consolidated financial statement, June 30, 1925

### DEBIT SIDE

Construction account:			
Primary projects—			
Cost of irrigation works—			
Original construction.....	\$151,448,386.31		
Supplemental construction.....	6,828,189.78		
Value of works taken over.....	1,890,839.11		
Total construction cost.....		\$160,176,415.20	
Operation and maintenance prior to public notice (net).....	2,376,947.59		
Operation and maintenance deficits and arrearages to be paid with construction.....	1,741,190.74		
		4,118,138.33	
		164,294,553.53	
Less—			
Abandoned works and nonreimbursable cost (net).....	2,357,269.43		
Construction revenues.....	4,380,691.75		
Contributed funds.....	1,023,597.64		
		7,761,558.82	
Total to be repaid by water users (Table 4).....			\$156,532,994.71
Yuma auxiliary project—			
Cost of irrigation works.....		839,306.26	
Less: Construction revenues.....		56.87	
			839,249.39
Operation and maintenance results (Table 9).....			1,087,284.94
Secondary projects and general investigations:			
Cost of investigations.....		2,598,368.37	
Less: Contributed funds.....		524,123.24	
			2,074,245.13
Plant and equipment.....			1,823,256.73
Materials and supplies.....			717,877.85
Accounts receivable:			
Current accounts due (Tables 10, 11, 12, 13, 14, 15).....		9,478,168.91	
Deferred accounts not due.....		96,278,809.17	
			105,756,978.08
Prepaid civil service retirement fund.....			2,914.80
Unadjusted debits: General office expense undistributed, disbursement vouchers in transit, etc.....			189,580.14
Cash (Table 2):			
Balance on hand, reclamation fund.....	6,575,104.23		
Balance on hand, Yuma auxiliary fund.....	41,843.92		
Balance on hand, general investigations fund.....	8,802.61		
Balance on hand, Wind River Indian fund.....	303.61		
		6,626,054.37	
Collections in transit.....		39,204.19	
			6,665,258.56
Total debits.....			275,689,640.33

TABLE 1.—Consolidated financial statement, June 30, 1925—Continued

## CREDIT SIDE

Security for repayment of cost of irrigation works: Contracted construction repayments (Table 5).....		\$122,556,694.59	
Yuma auxiliary contracted repayments.....		952,476.33	\$123,509,170.92
Accounts payable:			
Contractors' earnings.....		150,405.43	
Labor.....		242,121.25	
Purchases.....		194,670.83	
Transportation.....		201,746.50	
Miscellaneous.....		678,752.14	
			1,467,696.25
Unapplied credits: Forfeitures, penalties, hospital, rentals from withdrawn lands, etc.....			1,696,186.25
Unadjusted credits: Cost adjustments, collection vouchers in transit, etc.....			502.61
Government aid for reclamation of arid lands: Reclamation fund (Table 3).....		131,498,283.99	
Special funds—			
Judgments, Court of Claims.....		594,936.20	
Rio Grande Dam.....		1,000,000.00	
General investigations, 1923–December 31, 1924.....		275,000.00	
Increase of compensation.....		2,797,959.67	
Wind River Indian (Riverton).....		359,479.65	
Drainage and cut-over lands.....		99,815.08	
Advances to reclamation fund (bond loan).....	\$20,000,000.00		
Less: Amount repaid.....	5,000,000.00		
		15,000,000.00	
Total.....		151,625,474.59	
Less: Nonreimbursable appropriation, Rio Grande Dam (Table 4).....		1,000,000.00	
		150,625,474.59	
Less: Impairment of funds—			
Abandoned construction works (Table 4).....	928,217.31		
Nonreimbursable construction cost (Table 4).....	429,468.12		
Deficits, operation and maintenance (Table 9).....	250,704.86		
		1,608,390.29	
			149,017,084.30
Total credits.....			275,699,640.33

TABLE 2.—Available funds, expenditures, and balances, fiscal year 1925

	Funds					
	Reclamation	Yuma auxiliary	General investi- gations	Wind River, Indian (Riverton)	Judg- ments, Court of Claims	Increase of com- pen- sation
Balance on hand July 1, 1924.....	\$5,471,646.72	\$52,290.50	\$91,987.17	\$303.61		
Receipts:						
Proceeds from sale of public lands.....	757,109.97					
Proceeds from sale of town lots.....	4,470.16					
Proceeds from oil leasing act— Past production.....	115,273.98					
Current production.....	4,835,888.94					
Proceeds from potassium royalti- ties.....	5,216.52					
Proceeds from Federal power licenses.....	5,844.17					
From sale of lands and water rights.....		112,924.41				
From project collections.....	7,162,487.18	47,681.07	16,121.87			
From General Treasury.....					44,588.62	38,068.60
Total.....	18,217,339.68	87,047.16	108,109.04	303.61	44,588.62	38,068.60
Expenditures:						
Repayment bond loan.....	1,000,000.00					
Disbursements.....	10,642,285.45	45,203.24	99,306.43		44,588.62	38,068.60
Total.....	11,642,285.45	45,203.24	99,306.43		44,588.62	38,068.60
Balance on hand, June 30, 1925..	6,575,104.23	41,843.92	8,802.61	303.61		

<sup>1</sup> Contra.

TABLE 3.—Accretions to reclamation fund, by States

States	Sales of public lands		Sales of reclamation town sites		Proceeds from oil leasing act <sup>1</sup>		Potassium royalties and rentals <sup>1</sup>	Total to June 30, 1925
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Past production	Current production		
Alabama.....						\$45,349.50		\$45,349.50
Arizona.....	\$37,945.91	\$2,151,539.75						2,181,585.75
California.....	119,017.29	7,468,399.84						12,251,199.63
Colorado.....	105,238.40	9,808,409.90			\$2,377,819.72	2,379,802.00	\$25,198.07	9,877,094.50
Idaho.....	43,683.29	6,743,013.48		\$177,428.18		68,084.60		6,920,687.77
Kansas.....	56.18	1,033,483.94						1,033,483.94
Louisiana.....								2,108.76
Montana.....	75,957.31	14,815,064.42				2,108.76		15,439,145.01
Nebraska.....	759.67	2,082,192.33		125,083.58		499,038.01		2,082,192.33
Nevada.....	14,413.76	931,439.68						931,439.68
New Mexico.....	58,178.09	5,846,624.41				378.00		5,832,487.51
North Dakota.....	179.02	12,204,829.47				5,943.10		12,217,927.22
Oklahoma.....	3,884.58	5,921,707.68				13,100.78		5,921,707.68
Oregon.....	31,690.19	17,675,476.36						17,675,476.36
South Dakota.....	7,928.60	7,680,177.96		74,875.92		152.48		7,765,203.35
Utah.....	87,204.41	5,686,666.26				69,648.31		5,786,514.77
Washington.....	25,999.61	7,280,276.82				8,221.57		7,289,498.39
Wyoming.....	111,421.50	7,776,977.85			2,121,620.27	16,117,487.19		26,225,357.79
Total.....	757,109.97	107,165,289.14						131,487,827.94
Proceeds, Federal water-power licenses <sup>1</sup> .....				4,470.16	4,490,439.99	19,210,980.88	25,198.07	10,766.06
Grand total.....								131,498,283.99

<sup>1</sup> Totals to June 30, 1925.

Total proceeds for fiscal year 1925:

Oil leasing act, past production.

Oil leasing act, current production.

Potassium royalties and rentals.

Federal water power licenses.

<sup>2</sup> Contra.

\$15,273.98  
4,835,898.94  
5,216.52  
5,844.17



TABLE 4.—Consolidated statement by projects of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users

State and project	Construction cost		Operation and maintenance before notice (net)		Operation and maintenance deficits and arrearages		Construction revenues and contributed funds (contra)		Abandoned works and nonreimbursable cost	Total to be repaid by water users	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925		Fiscal year 1925	To June 30, 1925
Arizona: Salt River.....		\$12,744,222.59		\$115,963.50				\$2,312,096.81	\$382,097.31		\$10,166,021.97
Arizona-California:											
Yuma.....	\$106,890.49	8,851,759.17	\$1,431.66	371,017.49	\$1,919.39	\$1,945.71	\$2,006.96	158,578.99		\$104,747.37	9,066,743.38
California: Orland.....	1,367.90	1,141,864.39	148.50	11,878.49			986.16	15,574.72		233.24	1,114,411.18
Colorado:											
Grand Valley.....	880,834.82	4,633,155.24	4,443.83	113,595.23			2,098.62	59,643.70		373,902.37	4,967,017.77
Uncompahgre.....	1,068.61	6,437,912.91	3,013.36	301,713.15			1,306.64	29,665.24	47,870.81	638.10	6,467,560.01
Idaho:											
American Falls.....	1,662,630.45	3,777,462.02		422,192.62	9,668.31	9,668.31	11,038.17	191,314.03		1,673,698.63	3,968,776.05
Boise.....	202,496.11	13,915,533.88						207,305.90		199,498.45	14,140,120.71
King Hill.....	12,718.66	1,904,988.80	8,533.43	185,047.30	8,316.26	20,630.12	13,121.17	24,098.07		18,635.04	1,876,870.73
Minidoka.....	22,906.57	6,697,463.83	4,115.39	52,868.10			70,477.67	1,431,298.17		38,610.28	5,361,864.18
Kansas: Garden City.....		342,963.68						61,356.82	334,474.96		
Montana:											
Huntley.....	84.21	1,498,766.72	188.31	1,809.90	9,766.26	10,980.90	227.98	17,218.10		9,434.18	1,491,719.68
Milk River.....	102,143.45	6,680,760.99	34,707.42	423,660.59			1,579.17	63,220.88		136,271.70	7,041,280.70
San River.....	48,766.69	4,388,766.78	16,838.95	131,313.56	13,863.09	16,373.99	1,504.53	39,346.62		79,655.36	4,467,107.71
Montana-North Dakota: Lower Yellowstone.....	990.63	3,166,628.77	185.32	554.18		522,500.06	1,112.34	46,762.25		928.03	3,642,660.39
Nebraska: Wyoming: North Platte.....	1,285,717.38	16,394,548.18	84,728.68	581,266.77	68,090.13	150,488.08	1,630.07	150,096.77		1,390,145.26	16,966,061.26
Nevada: Newlands.....	52,945.85	7,507,661.61	185.60	1,540.11	2,134.43	4,157.36	3,370.07	176,506.80		51,524.61	7,584,762.96
New Mexico:											
Carlsbad.....	19,967.82	1,488,664.72	1,919.13	13,624.41		1,994.00	968.02	24,029.37		17,180.67	1,492,944.04
Hondo.....		339,491.68	35.49	32,962.01			541.03		371,902.66		
New Mexico-Texas: Rio Grande:											
North Dakota: Burdett-Treanton.....	467,540.86	13,802,246.22	19,761.06	274,986.78			1,432.64	37,346.60	1,000,000.00	446,336.88	12,489,965.84
Williston.....	2,072.29	223,423.06		31.75			416.00	1,967.62	221,423.69		
Oregon:		500,855.16		168,471.56			664.03	10,744.83		1,408.26	668,415.89
Baker.....	90,855.45										
Owyhee.....	3,703.04										
Umatilla.....	866,602.26	4,277,324.18									
Oregon-California: Klamath.....	607,466.48	5,074,439.41	3,309.34	68,782.93			4,826.68	27,608.10		891,772.33	4,440,337.08
							22,079.96	201,128.39		880,819.16	4,925,810.98



TABLE 4.—Consolidated statement by projects of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages		Construction revenues and contributed funds (contra)		Abandoned works and nonreimbursable cost	Total to be repaid by water users	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925		Fiscal year 1925	To June 30, 1925
Arizona: Salt River.....		\$12,744,222.59		\$115,963.50				\$2,312,094.81	\$382,097.31		\$10,166,021.97
Arizona-California:											
Yuma.....	\$108,889.49	8,851,759.17	\$1,431.65	371,617.49	\$1,919.39	\$1,945.71	\$2,609.95	158,578.99		\$104,747.27	9,046,743.28
California: Orland.....	1,367.90	1,141,864.39	\$148.50	\$11,878.49			986.16	13,574.72		253.24	1,114,411.18
Colorado:											
Grand Valley.....	880,834.82	4,633,154.24	\$4,443.83	113,505.23			2,698.62	59,643.70		373,692.97	4,687,017.77
Uncompaggre.....	1,068.61	6,437,912.91	\$3,013.36	301,713.16			\$1,306.64	29,665.24	47,870.81	\$638.10	6,662,890.01
Idaho:											
American Falls.....	1,662,630.45	3,777,462.02		422,192.62	9,066.31	9,668.31	\$11,038.17	\$191,314.03	1,673,668.62	1,673,668.62	3,968,776.05
Boise.....	202,496.11	13,915,353.58					12,724.77	207,305.80	199,468.65	199,468.65	14,140,121.71
King Hill.....	12,718.66	1,904,898.80	\$8,533.43				13,121.17	26,028.07	\$8,933.94	\$8,933.94	1,878,870.78
Minidoka.....	22,906.57	6,607,465.93	\$415.39	155,047.20	8,316.26	20,630.12	70,477.67	1,431,289.17	\$30,610.23	\$30,610.23	5,351,864.18
Kansas: Garden City.....		342,963.68		52,868.10				61,356.82	334,474.96		
Montana:											
Huntley.....	84.21	1,498,766.72	\$188.31	\$809.90	9,766.26	10,960.90	227.98	17,218.10		9,434.18	1,491,716.62
Milk River.....	102,143.45	6,680,760.99	24,707.43	423,690.59			1,576.17	63,220.88		135,271.70	7,041,293.70
Sun River.....	48,766.69	4,388,766.78	16,538.95	181,313.56	13,855.09	16,373.99	\$504.63	36,349.63		70,655.36	4,467,107.71
Montana-North Dakota: Lower Yellowstone.....	999.63	8,106,626.77	\$185.32	\$554.18		522,500.05	1,112.34	45,782.25		\$328.03	3,642,660.39
Nebraska: Wyming:											
North Platte.....	1,225,717.28	16,384,348.18	84,723.68	581,286.77	68,090.13	160,483.08	\$1,630.07	160,065.77		1,390,145.26	16,968,051.26
Nevada: Newlands.....	52,945.85	7,507,651.51	\$185.80	\$1,540.11	2,134.43	4,157.36	3,370.07	175,505.80		51,524.61	7,384,762.96
New Mexico:											
Carlsbad.....	19,967.82	1,438,664.72	\$1,019.13	32,924.01		1,934.00	968.02	24,029.37		17,180.67	1,402,944.04
Hondo.....		339,491.68	35.49					541.03	371,902.66		
New Mexico-Texas:											
Rio Grande.....	467,540.58	13,802,243.22	\$19,761.05	\$274,936.78			1,432.64	37,345.60	1,000,000.00	444,336.88	12,489,965.84
North Dakota:											
Burford-Trenton.....		223,423.06		\$31.75			415.00	1,967.62	221,428.69		
Williston.....	2,072.29	500,865.16		\$165.00		168,471.56	694.03	10,744.83		1,408.26	688,416.89
Oregon:											
Baker.....	\$60,855.45	60,855.45					\$5,000.00	5,000.00		55,855.45	55,855.45
Oryches.....	3,703.04	3,703.04								3,703.04	3,703.04
Umatilla.....	896,802.26	4,277,334.18					4,829.93	67,605.10		891,773.33	4,440,337.03
Oregon-California:											
Klamath.....	607,566.46	5,074,436.41	\$3,369.34	58,782.98		3,712.08	28,676.96	201,128.39		580,519.16	4,985,916.98



TABLE 5.—Consolidated statement of contracted construction repayments

State and project	Contracted repayments	
	Fiscal year 1925	To June 30, 1926
Arizona: Salt River.....		\$10,166,021.97
Arizona-California: Yuma.....	\$80,976.14	6,001,622.92
California: Orland.....	<sup>1</sup> 357.60	1,110,215.25
Colorado:		
Grand Valley.....		1,000,000.00
Uncompahgre.....		6,713,584.50
Idaho:		
American Falls.....	<sup>1</sup> 1,215,144.00	3,247,638.00
Boise.....	11,306.81	14,467,579.90
King Hill.....		2,000,000.00
Minidoka.....	2,401.77	6,086,921.40
Montana:		
Buntley.....	25,956.56	1,340,448.71
Sun River.....	12,472.00	422,423.13
Montana-North Dakota: Lower Yellowstone.....		3,614,301.81
Nebraska-Wyoming: North Platte.....	5,325,035.63	15,324,986.16
Nevada: Newlands.....	<sup>1</sup> 48,116.77	2,540,333.24
New Mexico: Carlsbad.....	420.00	1,424,312.75
New Mexico-Texas: Rio Grande.....	5,850,000.00	12,500,000.00
North Dakota: Williston.....		480,275.20
Oregon: Umatilla.....	1,023,750.00	4,423,822.97
Oregon-California: Klamath.....	29,359.00	3,994,716.60
South Dakota: Belle Fourche.....		4,345,277.42
Utah: Strawberry Valley.....	12,161.26	3,103,416.96
Washington:		
Okanogan.....		1,497,840.20
Yakima.....	240,015.15	9,917,308.60
Wyoming: Shoshone.....	<sup>1</sup> 136,728.45	5,705,848.71
<b>Total.....</b>	<b>11,178,890.07</b>	<b>122,556,694.60</b>

<sup>1</sup> Contra.

TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns, and other credits and results, calendar year 1934

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amount to be repaid with construction	
Arizona: Yuma auxiliary.....	\$41,519.13	\$58,128.92	\$88.75	<sup>1</sup> \$3.50	\$75.00	-----	-----	+ \$14,774.04
Arizona-California: Yuma.....	379,998.74	398,107.77	16,419.60	6,193.53	64,369.32	-----	\$1,919.39	-36,114.83
California: Orland.....	28,365.45	33,276.46	34.47	875.30	16.45	-----	-----	+4,086.63
Colorado: Uncompahgre.....	141,351.37	136,990.85	494.45	2,801.77	3,269.15	-----	-----	-3,398.69
Idaho: Boise.....	165,269.07	170,302.72	18,177.84	1,843.29	8,456.41	-----	-----	+29,824.61
Boise (drainage).....	145,629.29	138,102.69	14,137.95	1,040.32	-----	-----	-----	+5,571.08
King Hill.....	29,348.61	33,794.21	-----	-----	-----	-----	-----	+4,435.60
Minidoka.....	117,887.42	117,433.07	2,560.24	958.89	169.26	-----	-----	+1,346.26
Montana: Huntley.....	36,035.14	25,386.03	2,284.02	1,037.38	436.70	-----	9,766.26	+800.40
Sun River.....	9,770.22	<sup>1</sup> 3,019.80	906.69	184.91	165.51	-----	13,855.09	+1,951.26
Montana - North Dakota: Lower Yellowstone.....	70,132.82	69,779.74	-----	-----	353.08	-----	-----	-----
Nebraska-Wyoming: North Platte.....	206,966.32	149,292.47	689.96	1,648.02	1,968.48	-----	68,069.12	+12,406.70
Nevada: Newlands.....	187,837.13	183,170.94	3,891.62	2,407.10	480.90	-----	2,134.42	-366.34
New Mexico: Carlsbad.....	42,374.33	51,227.06	6,973.29	1,871.82	2,629.95	-----	-----	+16,581.15
New Mexico-Texas: Rio Grande.....	262,894.81	255,774.69	<sup>1</sup> 256.50	-----	6,723.00	-----	-----	-645.64
North Dakota: Buford-Trenton.....	-----	-----	-----	-----	-----	\$1,304.27	<sup>1</sup> 1,304.27	-----
Williston.....	75,701.98	-----	-----	-----	46,501.11	-----	-----	-29,200.87
Oregon: Umatilla.....	34,049.37	32,684.10	28.13	7.74	1,735.65	-----	-----	+390.77
Oregon - California: Klamath.....	67,978.08	57,068.20	87.81	182.54	427.89	-----	-----	-10,526.72
South Dakota: Belle Fourche.....	73,533.43	75,000.00	-----	-----	1,786.24	-----	-----	+3,252.81
Utah: Strawberry Valley.....	23,694.58	13,965.67	2,783.46	1,000.27	6,400.61	-----	1,846.33	-198.78
Washington: Okanogan.....	65,112.33	47,077.87	1,990.87	6.00	566.45	-----	-----	-15,483.14
Yakima.....	239,603.22	260,100.78	1,966.09	4,214.99	5,849.08	-----	<sup>1</sup> 194.90	+23,905.74
Wyoming: Shoshone.....	57,839.53	369.31	1,038.66	532.55	8,487.91	-----	44,769.28	-3,717.23
Total.....	2,501,381.77	2,300,003.73	74,023.40	26,752.92	32,126.51	1,304.27	140,380.74	+19,673.96

<sup>1</sup> Contra.

TABLE 7.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns, and other credits and results to December 31, 1924

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (-)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction	
Arizona: Yuma auxiliary.....	\$108,144.18	\$126,878.96	\$837.74	\$1,106.79	\$150.00			+\$17,315.78
Arizona-California: Yuma.....	2,385,132.50	1,785,730.48	48,723.53	20,039.85	103,000.99		\$1,945.71	-465,763.64
California: Orland.....	262,278.20	278,962.19	74.44	12,962.76	1,551.44			+4,701.12
Colorado: Uncompagre.....	281,845.74	295,386.35	494.45	5,963.39	4,049.46			+12,101.13
Idaho:								
Boise.....	1,903,115.95	1,913,615.26	43,998.51	44,884.24	122,426.67			+132,088.16
Boise (drainage).....	332,222.08	349,491.48	4,833.44	4,833.44				+237,755.78
King Hill.....	115,012.05	128,672.20	1,619.05	1,619.05				+7,141.10
Minidoka.....	1,663,599.10	1,619,416.30	27,354.67	20,179.49	98,067.31		12,313.86	+74,083.55
Montana:								
Huntley.....	911,501.99	491,029.45	10,917.85	8,707.87	8,939.56		10,980.90	-398,352.10
Sun River.....	218,129.67	170,418.96	3,469.28	3,192.24	2,479.24		16,373.99	-28,571.44
Montana-North Dakota: Lower Yellowstone.....	970,834.01	328,340.01	2.59	4.63	124,998.70		522,503.03	
Nebraska-Wyoming: North Platte.....	2,120,374.49	2,086,970.82	26,841.91	34,039.28	22,703.94		160,483.08	+132,586.86
Nevada: Newlands.....	1,263,224.88	1,194,706.08	16,662.00	20,251.46	19,348.87		4,157.36	-70,702.00
New Mexico: Carlsbad.....	556,543.63	683,468.44	23,538.90	9,187.30	15,338.03		1,934.00	+28,646.44
New Mexico-Texas: Rio Grande.....	904,010.38	899,701.72	1,426.46	4,486.44	7,368.64			
North Dakota:								
Bufford-Trenton.....	74,781.07	2,317.41			10.00	\$74,453.66		-28,102.42
Williston.....	841,280.68	26,677.76	1,918.76		439,401.99	178,667.30		+10,366.04
Oregon: Umatilla.....	624,478.67	400,960.49	6,375.70	3,294.17	28,244.74		190,627.95	+3,280.14
Oregon-California: Klamath.....	686,586.36	675,100.65	2,817.88	4,646.96	12,881.90		3,712.03	-92,086.72
South Dakota: Belle Fourche.....	1,088,283.37	688,731.89	31,955.32	9,241.66	12,477.44		506,496.99	+2,664.00
Utah: Strawberry Valley.....	396,971.96	385,231.29	6,255.67	10,280.16	17,083.43		1,346.33	
Washington:								
Okanogan.....	452,677.69	388,970.36	9,438.24	365.03	68,119.83		9,746.79	-6,767.40
Yakima.....	2,773,637.00	2,656,665.19	38,770.34	32,929.20	94,066.00		77,113.00	+60,848.38
Wyoming: Shoshone.....	715,507.98	671,618.87	10,584.38	10,644.70	23,150.22		44,907.03	+24,007.87
Total.....	21,670,942.42	18,226,902.79	338,407.42	262,821.11	1,237,435.40	261,120.86	1,722,060.63	-166,846.44
Total, Table No. 7, above.....	21,670,942.42	18,226,902.79	338,407.42	262,821.11	1,237,435.40	261,120.86	1,722,060.63	-166,846.44
Total, Table No. 7, twenty-third annual report.....	21,670,942.42	18,226,902.79	338,407.42	262,821.11	1,237,435.40	261,120.86	1,722,060.63	-166,846.44
Difference.....	2,668,670.26	2,409,641.76	74,476.39	26,362.36	32,201.61	1,304.27	140,350.74	+24,921.15
Total, Table 6.....	2,501,811.77	2,800,008.73	74,023.40	26,762.92	32,136.51	1,304.27	140,350.74	+19,673.96
Difference.....	162,268.49	169,638.03	451.99	2,629.34	75.00	0.00	0.00	+5,247.19
Reconciled as follows (previous years' transactions included above but not included in Table 6):								
Yuma auxiliary.....	66,628.05	69,750.04	451.99	1,110.29	75.00			+2,541.89
King Hill.....	88,663.44	89,887.99		1,518.06				+2,708.50

TABLE 8.—Consolidated statement by projects of operation and maintenance cost, operation and maintenance returns and other credits, and results, fiscal year 1936

State and project	Cost	Operation and maintenance returns				Other credits, amount to be repaid with construction	Remits, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues		
Arizona: Yuma auxiliary.....	\$51,331.15	\$51,828.60			\$507.00		+\$1,004.45
Arizona-California: Yuma.....	308,151.17	326,710.28	\$10,480.44	\$8,390.34	3,621.85	\$1,919.39	+26,199.40
California: Orland.....	26,737.79	33,276.44	69.62	917.00	103.20		+3,874.47
Colorado: Uncompahgre.....	138,100.43	137,204.91	2,116.94	2,745.63	3,499.38		+1,970.17
Idaho:							
Boise.....	186,031.39	166,899.67	32,290.38	1,220.44	7,910.02	9,068.31	+29,336.15
Boise (drainage).....	89,399.63	138,491.94	7,343.41	1,108.77			+40,293.65
King Hill.....	84,512.59	30,493.97					+5,303.32
Minidoka.....	118,290.32	96,794.70	702.57	1,278.96	196.26	8,310.26	-11,660.49
Montana:							
Humbley.....	36,300.45	26,019.59	1,781.91	979.15	444.06	9,766.26	+732.22
Sun River.....	10,863.99	12,287.40	2,456.19	186.94	187.91	13,865.09	+3,140.96
Montana-North Dakota: Lower Yellowstone.....	79,391.21	66,778.74			442.43		-9,169.04
Nebraska-Wyoming: North Platte.....	311,046.23	218,475.66	204.67	1,762.73	1,680.80	68,069.13	-24,378.70
Nevada: Newlands.....	143,527.03	167,040.19	5,768.08	2,866.69	4,860.90	2,124.43	+18,990.96
New Mexico: Carlsbad.....	41,182.92	51,237.06	3,497.10	1,870.15	2,310.47		+13,881.66
New Mexico-Texas: Rio Grande.....	309,859.14	264,332.81			6,913.50		-46,612.33
North Dakota: Williston.....	80,091.89	29,200.87			47,048.53		-3,942.49
Oregon: Umatilla.....	31,041.63	32,684.10	4.29	11.54	1,148.18		-2,783.50
Oregon-California: Klamath.....	73,871.60	68,483.51	334.20	108.31	1,298.88		-12,962.23
South Dakota: Belle Fourche.....	79,246.37	75,000.00	1,430.25		2,398.96		-2,317.56
Utah: Strawberry Valley.....	21,115.59	14,685.67	2,514.42	997.56	6,236.66	1,346.33	+2,069.93
Washington:							
Okanogan.....	65,898.77	47,744.37	2,821.22	6.00	410.40		-14,928.78
Yakima.....	247,935.39	268,099.38	6,365.36	3,825.15	6,019.26	124.24	+18,669.13
Wyoming: Shoshone.....	66,375.32	11,367.69	1,201.62	334.09	8,204.42	44,769.28	-16,911.68
<b>Total.....</b>	<b>2,554,327.10</b>	<b>2,273,861.42</b>	<b>79,511.17</b>	<b>28,109.45</b>	<b>105,397.07</b>	<b>159,840.14</b>	<b>+36,173.25</b>

1 Contra.



TABLE 9.—Consolidated statement by projects of operation and maintenance cost, operation and maintenance returns and other credits, and results, to June 30, 1935

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted (1)	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amount to be repaid with construction	
Arizona: Yuma Auxiliary.....	\$139,979.04	\$171,551.96	\$337.74	\$1,103.79	\$957.00			+\$31,600.87
Arizona-California: Yuma.....	2,528,755.93	1,794,260.95	55,508.08	27,949.73	111,572.62		\$1,945.71	—593,318.30
California: Orland.....	279,856.89	278,962.17	128.34	13,028.94	1,730.69			—12,044.63
Colorado: Uncompahgre.....	357,842.60	295,046.36	2,295.19	6,057.65	6,791.23			—89,796.47
Idaho:								
Boise.....	2,013,457.39	1,921,217.53	59,487.33	45,315.85	123,490.30		9,698.31	—55,099.23
Boise (Drainage).....	392,222.20	618,837.21	31,889.77	5,402.79				+283,091.99
King Hill.....	133,923.64	124,951.22		1,519.05				—10,491.46
Minidoka.....	1,721,468.38	1,639,073.45	27,786.29	20,566.49	98,697.31		20,630.12	+44,125.30
Montana:								
Huntley.....	927,319.18	490,225.04	11,994.26	8,737.04	9,450.27		10,980.90	—413,306.05
Sun River.....	225,612.66	170,414.46	5,433.11	3,217.70	2,504.62		16,373.99	—34,104.18
Montana-North Dakota: Lower Yellowstone.....	1,013,161.80	323,340.30	2,59	4.63	125,064.20		522,500.05	—42,629.29
Nebraska-Wyoming: North Platte.....	2,332,194.51	2,194,206.15	26,907.37	34,324.66	24,891.64		150,453.08	+41,967.17
Nevada: Newlands.....	1,331,907.33	1,168,364.21	21,213.72	20,260.05	23,976.87		1,577.36	—134,455.23
New Mexico: Carlsbad.....	579,720.13	1,553,468.44	24,812.17	9,619.33	16,608.09		1,684.00	+7,483.19
New Mexico-Texas: Rio Grande.....	1,075,650.44	899,701.72	1,426.46	4,486.44	7,559.14			—171,449.56
North Dakota:								
Biard-Trenton.....	74,781.07	2,317.41			10.00	\$72,453.66		—10,318.62
Williston.....	877,401.13	55,878.62	1,918.76		462,146.37	178,667.20	168,471.56	—7,701.39
Oregon: Umatilla.....	641,094.56	400,890.49	6,375.70	3,305.71	38,774.74		190,627.95	+41,363.63
Oregon-California: Klamath.....	731,692.90	675,085.45	3,108.71	4,645.96	13,043.84		3,712.08	+58,247.38
South Dakota: Belle Fourche.....	1,123,423.16	638,721.89	31,945.32	9,241.55	13,828.99		508,436.99	+1,346.33
Utah: Strawberry Valley.....	405,633.99	384,866.29	6,483.26	10,570.41	17,348.26			9,748.79
Washington:								
Okanogan.....	477,792.69	358,970.36	11,647.32	265.08	68,489.83		77,238.64	—146.57
Yakima.....	2,905,512.23	2,723,866.02	44,828.98	35,372.44	98,063.17			+1,568.56
Wyoming: Snakebone.....	764,482.38	668,980.17	11,374.93	10,677.74	28,366.64		1,741,190.74	—1,087,284.94
Total.....	23,093,547.45	18,554,978.68	387,034.35	275,674.84	1,293,612.72	251,120.86	1,741,190.74	—1,087,284.94
Total Table No. 9, above.....	23,093,547.45	18,554,978.68	387,034.35	275,674.84	1,293,612.72	251,120.86	1,741,190.74	—1,087,284.94
Total Table No. 9, twenty-third annual report.....	20,267,161.41	16,097,067.64	306,968.44	244,869.55	1,186,065.65	251,120.86	1,561,360.60	—1,147,528.77
Difference.....	2,742,386.04	2,457,929.04	80,065.91	20,735.29	105,547.07		159,840.14	+90,243.63
Total Table No. 8.....	2,554,327.10	2,273,861.42	79,511.17	28,109.45	105,397.07		159,840.14	+86,173.25
Difference.....	188,068.94	214,067.62	837.74	2,023.84	180.00			—94,070.68
Reconciled as follows (previous years' transactions included in Table 9, but not in Table 8):								
Yuma Auxiliary.....	88,647.89	119,723.36	537.74	1,103.79	180.00			+80,666.42
King Hill.....	90,411.05	94,344.26		1,519.05				—4,866.84

1 Includes charges to Dec. 31, 1924, only.

TABLE 10.—Accounts receivable, construction water-right charges (including Warren Act contract charges and contributed funds)

State and project	Due		Collected			Uncollected June 30, 1925 <sup>1</sup>
	Fiscal year 1925	To June 30, 1925 <sup>1</sup>	Cash		Other credits to June 30, 1925	
			Fiscal year 1925	To June 30, 1925		
Arizona:						
Salt River.....	\$609,961.32	\$2,306,883.96	\$609,961.32	\$2,306,883.96		
Yuma auxiliary.....	951,894.33	951,894.33	685,969.45	685,969.45		\$265,905.88
Arizona-California: Yuma.....	312,819.92	1,885,461.27	359,548.34	1,751,814.10	\$4,024.28	129,622.89
California: Orland.....	66,455.68	371,285.58	36,659.79	340,263.58		31,022.00
Colorado: Uncompahgre.....	106,124.59	370,622.96	23,818.90	77,833.69	43,265.88	249,638.39
Idaho:						
American Falls.....	2,005,684.25	2,089,291.25	1,536,620.91	1,570,227.91		469,063.34
Boise.....	674,171.98	3,082,724.64	226,621.13	1,834,744.00	25,092.00	1,222,888.64
King Hill.....	48,025.66	48,025.66	8,025.66	8,025.66		40,000.00
Minidoka.....	329,554.92	3,511,965.72	125,496.64	2,770,978.27	154,434.31	596,553.14
Montana:						
Huntley.....	31,377.69	449,025.54	18,580.32	395,965.18	502.21	52,558.15
Sun River.....	13,752.23	180,606.03	7,607.35	155,254.31	425.06	23,925.63
Montana-North Dakota:						
Lower Yellowstone.....	32,635.48	102,057.96	2,967.10	50,863.32		51,194.64
Nebraska-Wyoming: North Platte.....	335,183.31	3,161,278.93	45,427.75	1,822,467.76	35,697.27	1,303,113.90
Nevada: Newlands.....	44,903.31	637,095.28	31,912.59	577,074.70	7,805.82	52,214.76
New Mexico: Carlsbad.....	58,099.37	541,514.62	67,359.65	527,507.81		14,006.81
New Mexico-Texas: Rio Grande.....	197,330.40	472,345.20	197,330.40	472,345.20		
Oregon: Umatilla.....	82,441.12	566,223.80	6,269.03	388,677.65		177,546.15
Oregon-California: Klamath.....	70,263.48	692,692.51	71,189.26	661,344.95		31,347.56
South Dakota: Belle Fourche.....	199,428.26	659,294.96	45,999.89	471,758.05	266.57	187,270.34
Utah: Strawberry Valley.....	155,419.90	765,319.27	76,841.57	556,638.18		208,681.09
Washington:						
Okanogan.....	14,617.37	81,661.45	1,076.25	64,814.40		16,847.05
Yakima.....	443,174.89	4,136,709.67	268,375.96	3,765,090.95	36,047.07	335,571.65
Wyoming: Shoshone.....	54,128.79	998,911.45	5,214.98	630,856.92	2,424.66	335,629.87
Total.....	6,837,470.25	27,982,893.04	4,459,214.24	21,888,420.00	\$ 309,985.16	5,784,487.88
Paid in advance of due dates.....			469,974.93	1,003,580.94	\$ 34,387.93	
Refunds.....			3,567.64	24,519.63		
Total collections.....			4,932,756.81	22,916,520.57	344,373.09	

<sup>1</sup> Includes charges deferred under Relief Act of May 9, 1924. See table, p. 10.<sup>2</sup> Actual transactions for year; due \$153,700.41 (contra); collected \$14,083.66 (contra).<sup>3</sup> Transferred from advance payments; no collections during year.<sup>4</sup> Other credits for fiscal year, \$19,190.62. For details see project statements.<sup>5</sup> For details see project statements.<sup>6</sup> Decrease for fiscal year, \$6,590.80. For details see project statements.

TABLE 11.—Accounts receivable, operation and maintenance charges (after public notice)

State and project	Due		Collected			Uncollected June 30, 1925 <sup>1</sup>
	Fiscal year 1925	To June 30, 1925 <sup>1</sup>	Cash		Other credits to June 30, 1925	
			Fiscal year 1925	To June 30, 1925		
Arizona: Yuma auxiliary.....	\$171,551.96	\$171,551.96	\$394,745.56	\$394,745.56	\$1,106.79	\$75,699.61
Arizona-California: Yuma.....	328,629.62	1,794,260.95	299,856.69	1,560,520.94	32,974.14	170,763.87
California: Orland.....	33,276.44	278,982.17	25,775.49	259,189.39	13,025.94	6,796.84
Colorado: Uncompahgre.....	137,204.91	295,046.36	69,196.11	182,119.47	12,803.75	130,123.14
Idaho:						
Boise.....	166,899.67	1,921,217.53	50,661.89	1,413,485.78	45,315.85	462,415.90
Boise (drainage).....	138,491.94	618,827.21	75,820.45	381,578.96	5,402.79	231,845.46
King Hill.....	\$124,951.23	124,951.23	\$59,032.07	59,082.07	1,519.05	64,400.11
Minidoka.....	116,732.83	1,619,317.85	61,669.23	1,301,406.05	73,891.11	244,020.69
Montana:						
Huntley.....	35,785.85	490,325.04	30,572.87	382,384.18	9,481.13	98,459.73
Sun River.....	11,567.69	170,414.46	7,909.57	139,786.60	3,493.51	27,134.35
Montana-North Dakota:						
Lower Yellowstone.....	47,441.34	291,266.59	1,797.24	52,733.72	4.63	238,528.24
Nebraska-Wyoming: North Platte.....	218,475.66	2,196,206.15	157,729.96	1,522,941.53	44,715.01	628,549.61
Nevada: Newlands.....	109,605.48	1,023,295.07	98,142.62	874,791.42	32,023.37	116,480.28
New Mexico: Carlsbad.....	51,227.06	553,468.44	62,606.57	532,744.90	9,619.38	11,104.16
New Mexico-Texas: Rio Grande.....	211,833.40	809,145.80	211,877.10	797,571.50	4,486.44	7,067.86
North Dakota:						
Buford-Trenton.....		2,317.41		2,317.41		
Williston.....	29,200.87	55,878.62	11,535.57	38,213.32		17,665.30
Oregon: Umatilla.....	40,820.21	363,203.94	27,445.70	311,315.25	3,305.71	48,582.98
Oregon-California: Klamath.....	64,394.99	618,364.88	58,615.39	547,844.04	30,289.91	35,290.93
South Dakota: Belle Fourche.....	76,265.48	601,858.31	\$22,771.80	483,342.32	9,376.82	109,139.17
Utah: Strawberry Valley.....	41,032.00	360,255.46	24,274.71	296,839.49	10,570.41	52,845.56
Washington:						
Okanogan.....	35,963.28	319,506.78	3,992.62	268,401.09	2,620.61	48,485.08
Yakima.....	258,099.38	2,723,586.62	205,558.89	2,493,816.35	36,418.78	193,351.49
Wyoming: Shoshone.....	\$1,367.59	668,930.17	17,701.94	439,093.25	19,701.35	210,135.57
Total.....	2,448,123.70	18,067,179.00	1,679,288.95	14,436,214.59	\$402,096.48	3,226,867.93
Paid in advance of due dates.....			\$24,028.10	\$36,429.75	\$787.81	
Penalties and interest.....	\$80,048.91	\$387,034.35	\$47,255.27	\$333,288.02	\$18,163.72	\$35,582.61
Refunds.....			\$687.43	\$13,437.45		
Total collections.....			1,703,203.55	14,819,369.81	421,048.01	

<sup>1</sup> Includes charges deferred under Relief Act of May 9, 1924. See table, p. 10.<sup>2</sup> Actual transactions for fiscal year; due, \$51,823.60; collected, \$40,090.03.<sup>3</sup> Actual transactions for fiscal year; due, \$30,606.97; collected, \$4,059.97.<sup>4</sup> Transferred from advance payments. No collections during fiscal year.<sup>5</sup> Contra.<sup>6</sup> Other credits for fiscal year, \$41,616.52. For details see project statements.<sup>7</sup> For details see project statements.<sup>8</sup> Decrease for year, \$18.25. For details see project statements.<sup>9</sup> Decrease for year, \$638.72. For details see project statements.

TABLE 12.—Accounts receivable, rentals of irrigation water

State and project	Due		Collected			Uncollected June 30, 1925 <sup>1</sup>
	Fiscal year 1925	To June 30, 1925 <sup>1</sup>	Cash		Other credits to June 30, 1925	
			Fiscal year 1925	To June 30, 1925		
Arizona: Salt River.....		\$2, 246, 726. 01		\$2, 246, 726. 01		
Arizona: Yuma auxiliary.....	\$ 697. 00	697. 00	\$ 265. 00	265. 00		\$432. 00
Arizona-California: Yuma.....	2, 028. 71	446, 327. 44	1, 664. 58	441, 863. 87	\$292. 01	4, 171. 56
California: Orland.....	220. 50	120, 604. 50	220. 50	120, 604. 50		
Colorado:						
Grand Valley.....	52, 244. 23	327, 723. 32	50, 655. 85	295, 184. 56	5, 455. 13	27, 083. 63
Uncompahgre.....	6, 517. 99	1, 195, 632. 14	10, 016. 07	1, 164, 281. 63	12, 978. 59	18, 371. 92
Idaho:						
Boise.....	7, 910. 02	762, 203. 77	7, 271. 44	738, 279. 05	4, 720. 50	19, 204. 22
King Hill.....	\$ 68, 363. 94		\$ 50, 515. 83			
Minidoka.....	584. 65	272, 607. 98	716. 32	269, 373. 75	3, 234. 23	
Montana:						
Huntley.....	540. 72	7, 777. 45	606. 95	7, 377. 59		399. 86
Milk River.....	18, 026. 23	210, 085. 89	19, 212. 72	191, 374. 35	1, 174. 78	17, 636. 76
Sun River.....	19, 284. 57	71, 838. 74	16, 896. 32	42, 738. 55	921. 30	28, 158. 99
Montana-North Dakota:						
Lower Yellowstone.....	262. 50	123, 850. 49	377. 47	122, 445. 73		1, 404. 76
Nebraska-Wyoming: North Platte.....	65, 359. 88	287, 943. 25	71, 330. 96	279, 927. 40	10. 00	8, 005. 85
Nevada: Newlands.....	5, 036. 50	24, 397. 77	659. 00	18, 217. 92	6, 176. 85	3. 00
New Mexico:						
Carlsbad.....	4, 164. 04	26, 097. 05	4, 164. 04	26, 097. 05		
Hondo.....	\$ 35. 49	9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande.....	26, 515. 56	1, 144, 918. 68	37, 399. 20	1, 118, 215. 51		26, 703. 17
North Dakota:						
Buford-Trenton.....		31. 75		31. 75		
Williston.....		2, 117. 28		2, 117. 28		
Oregon: Umatilla.....	837. 50	34, 145. 54	837. 50	34, 145. 54		
Oregon-California: Klamath.....	8, 724. 08	52, 706. 39	8, 788. 46	52, 580. 89		124. 50
South Dakota: Belle Fourche.....	636. 07	6, 000. 89	636. 07	5, 833. 09	17. 80	150. 00
Utah: Strawberry Valley.....	5, 734. 90	14, 298. 54	5, 734. 90	14, 298. 54		
Washington:						
Okanogan.....	370. 00	109, 614. 48	437. 60	106, 660. 29	2, 584. 19	370. 00
Yakima.....	3, 481. 44	147, 367. 16	3, 195. 26	145, 940. 70		1, 426. 46
Wyoming:						
Riverton.....	150. 00	261. 75	150. 00	261. 75		
Shoshone.....	7, 779. 17	25, 427. 69	7, 650. 53	25, 159. 00	55. 92	312. 77
Total.....	148, 701. 83	7, 670, 531. 65	198, 380. 91	7, 479, 151. 00	\$ 37, 621. 30	153, 759. 35

<sup>1</sup> Includes charges deferred under Relief Act of May 9, 1924. See table, p. 10.<sup>2</sup> Actual transactions for year, due \$327, collected, \$95.<sup>3</sup> Contra.<sup>4</sup> Transferred to operation and maintenance.<sup>5</sup> Other credits for fiscal year, \$7,354.72. For details see project statements.

TABLE 13.—Accounts receivable, rentals of power and light

State and project	Due		Collected			Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits to June 30, 1925	
			Fiscal year 1925	To June 30, 1925		
Arizona: Salt River.....		\$998, 411. 03		\$998, 411. 03		
Idaho:						
Boise.....	\$11, 000. 00	139, 109. 91		96, 424. 61	\$42, 745. 30	
Minidoka.....	108, 243. 87	907, 290. 66	\$108, 489. 47	876, 309. 74	7, 274. 16	\$23, 706. 76
Nebraska-Wyoming: North Platte.....	39, 059. 29	152, 923. 87	31, 848. 33	129, 108. 76	19, 902. 00	3, 913. 11
Nevada: Newlands.....	13, 610. 94	216, 448. 31	13, 593. 35	189, 752. 42	23, 505. 75	1, 190. 14
New Mexico-Texas: Rio Grande.....		2, 243. 33		2, 243. 33		
North Dakota: Williston.....	46, 630. 48	456, 566. 68	46, 411. 48	453, 091. 48		3, 475. 20
Oregon-California: Klamath.....		7, 697. 18		7, 697. 18		
Utah: Strawberry Valley.....	25, 823. 45	177, 333. 10	23, 237. 01	173, 198. 73		4, 134. 37
Washington:						
Okanogan.....		1, 754. 71		1, 754. 71		
Yakima.....		3, 635. 33		3, 635. 33		
Wyoming:						
Riverton.....	3, 926. 91	3, 926. 91	3, 000. 79	3, 000. 79		926. 12
Shoshone.....	9, 452. 91	24, 090. 25	9, 359. 83	23, 329. 27	16. 00	744. 98
Total . . . *	257, 747. 85	3, 091, 491. 27	232, 940. 26	2, 957, 957. 38	95, 443. 21	38, 090. 68

<sup>1</sup> Other credits for fiscal year, \$19,118.15.

TABLE 14.—Accounts receivable, rentals of grazing and farming lands

State and project	Due		Collected			Uncollected June 30, 1925
	Fiscal year 1925	To June 30, 1925	Cash		Other credits to June 30, 1925	
			Fiscal year 1925	To June 30, 1925		
Arizona: Salt River.....		\$19, 373. 14		\$19, 373. 14		
Arizona-California: Yuma.....	\$3, 118. 60	16, 975. 62	\$2, 998. 60	16, 702. 45		\$273. 17
California: Orland.....		79. 50		79. 50		
Colorado:						
Grand Valley.....	65. 00	344. 00	77. 00	294. 00	\$7. 50	42. 50
Uncompahgre.....	45. 00	242. 45	45. 00	242. 45		
Idaho:						
Boise.....	882. 80	21, 551. 00	281. 50	20, 861. 00		690. 00
Minidoka.....	766. 69	35, 138. 85	826. 06	31, 083. 99		4, 104. 86
Montana:						
Huntley.....	953. 56	13, 627. 78	902. 93	13, 146. 06		481. 72
Milk River.....	3, 813. 89	34, 728. 23	3, 813. 89	34, 304. 58	38. 88	384. 77
Sun River.....	3, 304. 27	37, 429. 10	3, 519. 58	34, 333. 68		3, 095. 42
Montana - North Dakota:						
Lower Yellowstone.....	168. 68	3, 277. 63	273. 68	3, 277. 63		
Nebraska-Wyoming: North Platte.....	6, 710. 62	89, 780. 70	7, 304. 45	84, 861. 83		4, 918. 87
Nevada: Newlands.....	5, 824. 42	35, 450. 82	4, 544. 54	32, 254. 44		3, 196. 38
New Mexico: Carlsbad.....	476. 18	13, 642. 42	361. 62	12, 993. 42		649. 00
New Mexico-Texas: Rio Grande.....	160. 00	2, 111. 70	111. 50	2, 063. 20		48. 50
North Dakota:						
Buford-Trenton.....		423. 93		423. 93		
Williston.....		249. 98		249. 98		
Oregon: Umatilla.....	439. 20	2, 540. 75	266. 20	2, 317. 75		223. 00
Oregon-California: Klamath.....	24, 984. 30	201, 749. 45	25, 520. 30	201, 665. 45	84. 00	
South Dakota: Belle Fourche.....	345. 17	987. 11	247. 57	885. 51		101. 60
Utah: Strawberry Valley.....	15, 470. 70	166, 751. 06	15, 470. 70	166, 751. 06		
Washington:						
Okanogan.....	84. 00	856. 50	84. 00	856. 50		
Yakima.....	1, 970. 19	25, 031. 69	2, 168. 19	24, 820. 49		211. 20
Wyoming: Shoshone.....	1, 038. 50	10, 628. 11	1, 017. 50	10, 397. 11		231. 00
Secondary projects.....	11, 895. 27	174, 922. 26	12, 465. 44	132, 008. 79	42, 497. 67	420. 80
Total.....	82, 517. 04	907, 893. 78	82, 301. 25	846, 192. 94	42, 628. 05	19, 072. 79

<sup>1</sup> Other credits for fiscal year, \$7.50

TABLE 15.—Accounts receivable, miscellaneous and sundry

State and project	Amount	State and project	Amount
Arizona: Yuma auxiliary .....	\$1,984.70	New Mexico-Texas: Rio Grande.....	\$450.13
Arizona-California: Yuma.....	4,481.66	North Dakota: Williston.....	81.49
Colorado:		Oregon: Umatilla.....	1,293.57
Grand Valley.....	32.72	Oregon-California: Klamath.....	1,857.17
Uncompahgre.....	3,514.53	South Dakota: Belle Fourche.....	6,895.02
Idaho:		Utah: Strawberry Valley.....	1,493.48
American Falls.....	39,314.58	Washington:	
Boise.....	61,228.44	Okanogan.....	1,553.60
King Hill.....	67.80	Yakima.....	2,490.22
Minidoka.....	93.60	Wyoming:	
Montana:		Riverton.....	581.55
Huntley.....	55.30	Shoshone.....	14,470.79
Milk River.....	12.26	Secondary projects.....	32,073.71
Sun River.....	498.35	Washington office.....	250.98
Montana-North Dakota: Lower Yellow-		Denver office.....	21,600.12
stone.....	653.75	Field legal.....	4,521.72
Nebraska-Wyoming: North Platte.....	17,128.07		
Nevada: Newlands.....	262.76	Total.....	218,307.67
New Mexico: Carlsbad.....	72.65		

TABLE 16.—Voucher transactions, all funds, and net investments, as of June 30, 1925

State and project	Expenditures <sup>1</sup>		Collections <sup>2</sup>		Net investment	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
Arizona: Salt River.....		\$14,671,484.24	\$659,233.50	\$6,539,933.23	\$659,233.50	\$8,131,551.01
Arizona-California:						
Yuma.....	\$460,730.01	12,986,746.85	708,170.30	4,496,699.20	\$247,440.29	8,490,047.65
California: Orland.....	22,747.80	1,557,857.54	65,981.03	769,985.75	\$43,233.23	787,871.79
Colorado:						
Grand Valley.....	359,680.70	5,197,423.90	60,991.17	443,451.06	298,689.53	4,753,972.84
Uncompahgre.....	134,253.32	8,399,757.48	109,252.51	1,637,004.89	25,000.81	6,762,752.59
Idaho:						
American Falls.....	1,726,406.78	3,828,992.78	2,212,823.36	2,723,657.02	\$486,416.58	1,105,335.76
Boise.....	616,063.33	18,028,004.66	396,859.84	5,245,178.68	219,203.49	12,782,825.98
King Hill.....	42,329.75	2,085,565.22	14,526.45	127,823.26	27,803.30	1,957,741.96
Minidoka.....	194,190.46	8,987,232.30	319,571.13	5,606,707.19	\$125,380.67	3,380,525.11
Kansas: Garden City.....		390,495.54		58,002.27		332,493.27
Montana:						
Huntley.....	32,112.40	2,483,688.30	55,676.63	890,586.10	\$23,564.23	1,603,102.20
Milk River.....	71,741.88	7,411,311.33	29,916.88	415,191.93	41,825.05	6,996,119.40
Sun River.....	87,703.94	4,928,757.64	43,786.53	509,702.94	43,917.41	4,419,054.70
Montana-North Dakota:						
Lower Yellowstone.....	96,353.03	4,225,460.96	20,421.28	342,504.95	75,931.75	3,882,956.01
Nebraska-Wyoming:						
North Platte.....	1,675,942.05	20,084,677.87	414,376.44	4,345,681.53	\$1,261,545.61	15,688,996.34
Nevada: Newlands.....	223,202.96	9,156,054.31	168,352.53	1,929,711.85	54,850.43	7,226,342.46
New Mexico:						
Carlsbad.....	60,912.94	2,052,538.29	142,670.91	1,198,485.78	\$81,757.97	854,052.51
Hondo.....		406,744.36		34,841.70		371,902.66
New Mexico-Texas: Rio Grande.....	816,270.79	16,470,547.81	508,647.91	3,062,240.67	307,622.88	13,408,307.14
North Dakota:						
Buford-Tranton.....	\$40.00	311,189.60	251.00	17,708.93	\$291.00	293,480.67
Williston.....	83,122.61	1,393,863.16	59,419.25	517,395.87	23,703.36	876,467.29
Oregon:						
Baker.....	\$59,200.83	59,200.83	\$879.29	879.29	\$58,321.54	58,321.54
Owyhee.....	4,407.10	4,407.10			4,407.10	4,407.10
Umatilla.....	909,408.11	5,248,531.38	51,760.13	962,112.92	857,647.98	4,286,418.46
Vale.....	68.95	68.95			68.95	68.95
Oregon-California:						
Klamath.....	644,886.56	5,940,949.22	170,500.77	1,562,548.85	474,385.79	4,378,400.37
South Dakota: Belle Fourche.....	71,276.17	4,744,710.22	11,818.05	1,096,289.80	59,458.12	3,648,420.42
Utah:						
Salt Lake Basin.....	8,857.22	8,857.22			8,857.22	8,857.22
Strawberry Valley.....	45,011.96	4,271,808.73	163,684.07	1,452,243.58	\$118,672.11	2,819,565.15
Washington:						
Okanogan.....	76,694.86	1,959,995.60	11,376.79	499,670.10	65,318.07	1,460,325.50
Yakima.....	1,048,284.17	17,809,835.31	608,022.20	7,282,887.29	440,261.97	10,526,948.02

See footnotes at end of table.

TABLE 16.—*Voucher transactions, all funds, and net investments, as of June 30, 1925—Continued*

State and project	Expenditures <sup>1</sup>		Collections <sup>2</sup>		Net investment	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
Wyoming:						
Riverton.....	\$852, 425. 42	\$2, 944, 366. 19	\$18, 535. 48	\$52, 363. 95	\$833, 898. 94	\$2, 892, 002. 24
Shoshone.....	229, 334. 00	10, 191, 984. 39	56, 478. 45	1, 383, 491. 72	172, 860. 55	8, 806, 492. 67
Secondary (including Deschutes) <sup>3</sup>	43, 235. 79	2, 177, 011. 54	42, 421. 91	655, 929. 97	813. 88	1, 531, 081. 57
Denver office (net not transferred to projects) <sup>4</sup>	<sup>5</sup> 14, 496. 63	233, 094. 84	12, 151. 42	177, 590. 07	<sup>6</sup> 26, 648. 05	55, 504. 77
Field legal (net not transferred to projects) <sup>4</sup>	<sup>7</sup> 3, 829. 12	9, 661. 49	1, 320. 95	7, 394. 12	<sup>8</sup> 5, 150. 07	2, 267. 37
Washington office (net not transferred to projects) <sup>4</sup>	<sup>9</sup> 38, 696. 39	356, 442. 41	12, 010. 77	330, 871. 59	<sup>10</sup> 50, 707. 16	25, 570. 82
Adjustment surveys, subsection K.....	41, 313. 39	41, 313. 39	-----	-----	41, 313. 39	41, 313. 39
Indian projects <sup>7</sup>	-----	2, 997, 829. 24	-----	2, 997, 829. 24	-----	-----
Civil service retirement fund (unabsorbed) <sup>11</sup>	<sup>12</sup> 5, 619. 49	2, 914. 80	-----	-----	<sup>13</sup> 5, 619. 49	2, 914. 80
Drainage and cut over <sup>1</sup>	100, 544. 02	100, 544. 02	-----	-----	100, 544. 02	100, 544. 02
General investigations <sup>14</sup>	291, 377. 37	296, 497. 53	608. 30	26, 108. 30	290, 774. 07	270, 394. 23
Yuma auxiliary <sup>11</sup>	811, 975. 60	811, 975. 60	830, 273. 33	830, 273. 33	<sup>15</sup> 18, 297. 78	<sup>16</sup> 18, 297. 78
Total.....	11, 879, 384. 64	205, 220, 394. 14	7, 982, 760. 51	60, 220, 973. 92	3, 896, 624. 13	144, 999, 420. 23

<sup>1</sup> Expenditures from reclamation fund, increase of compensation, judgments, Court of Claims, Rio Grande Dam appropriation, Wind River Indian (Riverton), drainage and cut over, general investigations, Reclamation Service, 1923-Dec. 31, 1924, and Yuma auxiliary fund. See Table 17. Amounts given for each project include net transfers (transfers from other projects less transfers to other projects).

<sup>2</sup> Collections creditable to increase of compensation, Rio Grande Dam appropriation, Wind River (Indian), drainage and cut over, and general investigations, Reclamation Service, 1923-Dec. 31, 1924, are included in the expenditure column as contra.

<sup>3</sup> Contra.

<sup>4</sup> Transferred from secondary. Actual transactions for year; expenditures, \$5,092.15; collections, none; investment increase, \$5,092.15.

<sup>5</sup> Transferred to Baker; expenditures, \$54,128.68; collections, \$379.29; net investment, \$53,749.39. Actual transactions for year; expenditures, \$97,364.47; collections, \$43,301.20; investment increase, \$54,063.27.

<sup>6</sup> For analysis see Table 18.

<sup>7</sup> Expended for Bureau of Indian Affairs from reclamation fund and later reimbursed by Congressional appropriation.

<sup>8</sup> Analysis of civil service retirement fund:

Transferred from reclamation fund to civil service retirement fund.....	\$118, 785. 00
Deducted from pay of employees.....	115, 870. 20

Unabsorbed balance.....	2, 914. 80
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<sup>9</sup> No transactions during fiscal year.

<sup>10</sup> Actual transactions during fiscal year; expenditures, \$103,775.44; collections, \$608.30; investment increase, \$103,172.14.

<sup>11</sup> Actual transactions during fiscal year; expenditures, \$68,749.43; collections, \$34,756.66; investment increase, \$33,992.77.

TABLE 17.—*Voucher transactions, all funds, and net investment as of June 30, 1925, analysis by funds*

Item	Expenditures		Collections		Net investment	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
Reclamation fund.....	\$10,642,285.45	\$190,313,880.35	\$7,152,487.18	\$50,390,700.59	\$3,489,798.27	\$139,923,179.76
Increase of compensation (net).....	38,068.69	2,797,959.67	-----	-----	38,068.69	2,797,959.67
Judgments, Court of Claims.....	44,588.62	594,936.20	-----	-----	44,588.62	594,936.20
Rio Grande Dam appropriation (net).....	-----	1,000,000.00	-----	-----	-----	1,000,000.00
Wind River Indian (Riverton) (net).....	-----	359,176.04	-----	-----	-----	359,176.04
General investigations, Reclamation Service, 1923-Dec. 31, 1924, fund (net).....	<sup>1</sup> 266,197.39	266,197.39	-----	-----	266,197.39	266,197.39
Yuma auxiliary project fund <sup>2</sup> .....	788,429.41	788,429.41	830,273.33	830,273.33	<sup>3</sup> 41,843.92	<sup>4</sup> 41,843.92
Drainage and cut-over fund (net) <sup>4</sup> .....	99,815.08	99,815.08	-----	-----	99,815.08	99,815.08
Total.....	11,879,384.64	205,220,394.14	7,982,760.51	50,220,973.92	3,896,624.13	144,999,420.23

<sup>1</sup> Expenditures during fiscal year, \$33,184.56.<sup>2</sup> Expenditures during fiscal year, \$45,203.24; collections, \$34,756.66.<sup>3</sup> Contra.<sup>4</sup> No transactions during fiscal year.TABLE 18.—*Analysis of voucher transactions and net investment, general offices, as of June 30, 1925*

Item	Denver		Field legal		Washington	
	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925	Fiscal year 1925	To June 30, 1925
Reclamation fund disbursements.....	\$245,160.47	\$1,756,770.10	\$51,339.45	\$587,819.81	\$156,081.75	\$5,347,332.91
Increase of compensation (net).....	1,261.00	-----	<sup>1</sup> 249.81	-----	<sup>1</sup> 1,930.87	-----
Total.....	246,421.47	1,756,770.10	51,089.64	587,819.81	154,100.88	5,347,332.91
Less:						
Net transfers.....	260,918.10	1,523,675.26	54,918.76	578,158.32	192,797.27	4,990,890.50
Collections.....	12,151.42	177,596.07	1,320.95	7,394.12	12,010.77	330,871.59
Total.....	273,069.52	1,701,265.33	56,239.71	585,552.44	204,808.04	5,321,762.09
Net investment.....	<sup>1</sup> 26,648.05	55,504.77	<sup>1</sup> 5,150.07	2,267.37	<sup>1</sup> 50,707.16	25,570.83

<sup>1</sup> Contra.



TABLE 19.—Appropriations by projects for the fiscal year 1925, increases and decreases authorized, expenditures and liabilities, and balances unencumbered

State	Project	Appropriation acts	10 per cent increases and decreases	Contributed funds	Miscellaneous collections and transfers	Total authorized	Expenditures	Balance unexpended	Liabilities	Balance unencumbered
Arizona	Salt River	\$5,000.00				\$5,000.00	\$5,521.62	\$5,000.00	\$4,818.65	\$5,000.00
Do.	Yuma Auxiliary	200,000.00				200,000.00	406,460.49	191,478.38	170,105.36	186,659.73
Arizona-California	Orland	787,000.00	\$76,500.00		\$63,764.77	927,264.77	28,470.12	620,795.28	2,872.83	341,639.98
California	Grand Valley	96,000.00			3,625.04	96,625.04	321,554.41	216,600.89	65,578.83	66,262.90
Colorado	Uncompahgre	476,000.00			62,615.30	538,615.30	183,197.04	53,170.44	5,319.63	161,062.00
Do.	American Falls	166,000.00			20,368.38	186,368.38	1,372,669.55	1,902,630.78	443,219.17	47,860.81
Idaho	Boise	690,000.00		\$2,622,141.42	72,159.21	3,275,300.63	1,601,344.62	499,034.04	101,408.49	1,459,411.61
Do.	King Hill	1,110,000.00			54,344.62	1,164,344.62	154,548.58	18,883.12	2,417.59	397,594.55
Do.	Mindoka	44,000.00			126,213.05	170,213.05	27,035.79	115,701.87	331,556.10	16,467.83
Montana	Huntley	385,000.00			3,737.66	388,737.66	63,583.53	260,242.21	142,338.68	117,908.82
Do.	Milk River	154,000.00			31,325.76	185,325.76	81,985.43	90,473.17	5,632.10	84,020.07
Do.	Sun River	157,000.00			30,457.60	187,457.60	62,985.49	32,499.86	5,904.13	26,595.73
Nebraska-North Dakota	Lower Yellowstone	102,000.00		\$3,972.38	2,985.35	108,957.73	1,239,016.29	1,327,513.08	13,211.20	314,942.92
Nevada	North Platte	412,000.00			215,798.43	627,798.43	41,775.74	25,041.42	1,833.48	23,208.04
New Mexico	Carlsbad	57,289.00			80,287.26	137,576.26	73,528.92	131,268.84	52,491.74	78,777.10
New Mexico-Texas	Rio Grande	746,000.00			97,697.70	843,697.70	78,458.28	62,604.96	2,357.45	60,247.51
North Dakota	Williston	104,000.00			46,049.23	150,049.23	2,554.55	495,786.97	12.90	495,799.87
Oregon	Baker	466,336.04			8.48	466,344.52	4,446.47	311,556.53	69,914.29	311,643.89
Do.	Owyhee	316,000.00			3.00	316,003.00	725,446.93	249,963.18	46,346.31	180,623.89
Do.	Umatilla	964,000.00			24,403.11	978,403.11	354,852.27	330,962.14	7,512.94	182,639.58
Oregon-California	Klamath	704,000.00			46,864.41	750,864.41	63,752.14	368,423.54	3,165.89	365,257.65
South Dakota	Belle Fourche	192,000.00			8,794.56	200,794.56	7,576.46	63,565.85	3,165.89	60,400.66
Utah	Salt Lake Basin	376,000.00				376,000.00	42,261.24	14,407.56	8,572.97	6,834.99
Do.	Strawberry Valley	45,000.00			60,817.09	105,817.09	70,456.35	563,742.78	35,662.76	528,080.02
Washington	Okanogan	74,000.00			3,892.81	77,892.81	838,967.19	53,140.99	41,163.15	11,867.94
Do.	Yakima	1,163,000.00			182,699.97	1,345,699.97	702,474.35	286,083.40	49,516.82	286,565.98
Wyoming	Riverton	670,000.00			20,615.34	690,615.34	240,402.81	110,816.48	1,591.19	109,225.29
Do.	Shoshone	495,000.00			78,036.21	573,036.21	82,315.42	167,280.69	152,753.60	34,477.09
Do.	Adjustment surveys, subsection K	160,000.00				160,000.00	39,083.62	110,816.48	1,591.19	109,225.29
Do.	Secondary	198,500.00			23,263.12	241,763.12	82,315.42	167,280.69	152,753.60	34,477.09
Total		\$14,120,124.04		2,635,606.70	2,263.12	18,101,577.12	8,725,368.35	9,376,208.77	1,571,801.77	7,804,407.00

1 Decrease.

2 Includes \$48,500 emergency transfer Boise to Newlands.

3 Appropriations as follows:

Act of June 6, 1924 (43 Stat., 416-419)

Act of June 6, 1924, unexpended balance, Baker

Act of Dec. 6, 1924 (43 Stat., 684 and 685)

Total

\$10,856,000.00

2,011,500.00

Act of Dec. 6, 1924 (43 Stat., 705)

Act of Jan. 20, 1925 (43 Stat., 765)

Act of Mar. 4, 1925 (43 Stat., 1280-1281)

Total

14,120,124.04

365,600.00

150,000.00

250,569.00

14,120,124.04

## ENGINEERING DATA FOR PROJECTS ON COMPLETION

[The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams, and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canals they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress]

### *Engineering data for projects when completed*

#### RESERVOIRS

Projects	Name	Area	Capacity	Spillways			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
		<i>Acres</i>	<i>Acres-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Arizona: Salt River....	Roosevelt.....	18,100	1,637,300	420	240	113,000	150,000
Do.....	Mormon Flat.....	1,400	90,000	243	159	-----	150,000
Do.....	Horse Mesa.....	3,500	350,000	243	300	-----	150,000
Do.....	Cave Creek flood control.	670	14,000	1,732	59	20,000	60,000
California: Orland.....	East Park.....	1,850	51,000	415	88	8,000	12,000
Colorado: Uncompahgre	Taylor Park.....	2,260	106,000	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Idaho:							
Boise.....	Deer Flat.....	9,835	177,000	None.	-----	-----	-----
Do.....	Arrowrock.....	2,860	280,000	402	247	15,000	40,000
Minidoka.....	Lake Walcott.....	11,850	150,000	2,385	42	40,000	60,000
Do.....	Jackson Lake.....	25,540	847,000	160	41	7,500	13,000
Do.....	American Falls.....	56,500	1,700,000	540	50	60,000	115,000
Montana:							
Milk River.....	Sherburne Lakes.....	2,000	75,000	160	68	4,200	8,000
Do.....	St. Mary Lakes.....	6,910	124,000	500	-----	20,500	20,000
Do.....	Nelson Reservoir.....	4,560	68,500	( <sup>1</sup> )	23	-----	-----
Do.....	Point of Rocks.....	180	830	740	8	40	700
Do.....	Chain Lakes.....	9,400	244,000	300	58	4,300	10,000
Sun River.....	Willow Creek <sup>7</sup> .....	2,696	86,000	200	100	725	( <sup>1</sup> )
Do.....	Beaver Creek <sup>8</sup> .....	1,360	105,000	275	190	-----	42,500
Do.....	Pishkun Reservoir <sup>9</sup> .....	1,542	45,700	Under control.	-----	-----	-----
Do.....	Muddy Creek.....	1,828	33,000	-----	80	284	( <sup>1</sup> )
Do.....	Benton Lake.....	9,300	144,000	Under control.	-----	-----	-----
Nebraska-Wyoming:							
North Platte.....	Pathfinder.....	22,700	1,070,000	605	184	40,000	-----
Do.....	Lake Alice.....	900	11,400	100	18	2,500	-----
Do.....	Lake Minatare.....	2,240	60,760	100	55	2,000	-----
Do.....	Winters Creek Lake.....	360	3,000	None.	-----	-----	-----
Do.....	Guernsey.....	2,336	72,700	10 80	45	-----	50,000
				11 128	95	-----	30,000
Nevada: Newlands.....	Lake Tahoe.....	120,000	120,000	85	6	2,500	-----
Do.....	Lahontan.....	10,000	273,600	500	112	18,800	30,000
Do.....	Spanish Springs.....	9,400	300,000	60	96	1,600	1,600
New Mexico: Carlsbad.	Avalon.....	970	7,000	1,026	21	86,000	120,000
Do.....	McMillan.....	6,600	45,000	1,750	26.1-24.9	34,500	60,000
New Mexico-Texas: Rio Grande.	Elephant Butte.....	40,080	2,638,000	275	193	8,000	16,000
Oregon: Umatilla.....	Cold Springs.....	1,500	50,000	330	90	6,000	6,000
Do.....	McKay.....	1,600	75,000	120	140	10,000	10,000
Oregon-California: Klamath.	Upper Klamath Lake.....	60,000	400,000	None.	-----	-----	-----
Do.....	Clear Lake.....	25,000	462,000	357	24	10,000	30,000
Do.....	Gerber.....	3,800	94,000	150	63	-----	10,000

<sup>1</sup> Undetermined.

<sup>2</sup> 95,180 acre-feet only available; above fixed crest of spillway.

<sup>3</sup> Contract for smaller dam, with provision for increasing height if desired.

<sup>4</sup> Average flow of stream on which reservoir is located.

<sup>5</sup> No spillways; drainage limited; elevation is that of water surface.

<sup>6</sup> Consists of 8 siphons each 5 feet high and 10 feet wide at throat.

<sup>7</sup> Present capacity 16,700 acre-feet.

<sup>8</sup> Tentative.

<sup>9</sup> Present capacity 3,523 acre-feet.

<sup>10</sup> One 50 by 50 foot Stonely gate; gate sill 45 feet above river bed.

<sup>11</sup> Two 64 by 14½ foot Drum gates; top elevation 95 feet above river bed.

<sup>12</sup> At spillway level. Proposed to increase to 290,000 by adding 2 feet by movable crests.

## Engineering data for projects when completed—Continued

## RESERVOIRS—Continued

Projects	Name	Area	Capacity	Spillways			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
		<i>Acres</i>	<i>Acre-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
South Dakota: Belle Fourche.	Belle Fourche.....	8,010	203,000	314.	100	2,000	2,000
Utah: Strawberry Valley.	Strawberry Valley....	8,370	255,000	58	61	500	2,000
Washington:							
Okanogan.....	Salmon Lake.....	240	10,500	Siphon.	48		400
Do.....	Conconully.....	460	14,400	180	58	4,500	16,000
Yakima.....	Bumping Lake.....	1,300	34,000	235	36		6,000
Do.....	Lake Clealum.....	4,680	501,000	420	112		18,000
Do.....	Lake Kachess.....	4,540	210,000	250	53		7,200
Do.....	Tieton.....	2,500	202,500	390	206		50,000
Do.....	Lake Keechelus.....	2,550	152,000	300	60		10,000
Do.....	Clear Creek.....	270	5,830	261	58		
Wyoming:							
Riverton.....	Pilot Butte.....	882	30,000	100			500
Do.....	Bull Lake.....	3,100	145,000	170	67	4,000	8,000
Shoshone.....	Shoshone.....	6,600	456,600	300	233	11,000	30,000
Do.....	Ralston.....	200	2,100				
Do.....	Deaver.....	80	680	None.			
Total.....		525,409	14,236,400				

## STORAGE DAMS

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Arizona: Salt River.	Roosevelt <sup>11</sup> .....	Rubble masonry arch, gravity.	280	1,125	342,325
Do.....	Mormon Flat.....	Concrete, variable radius arch.	224	444	43,500
Do.....	Horse Mesa.....	do.....	301	665	126,000
Do.....	Cave Creek flood control.	Reinforced concrete multiple arch.	107	1,732	18,774
California: Orland.	East Park <sup>12</sup> .....	Concrete arch, gravity.	139	250	12,200
Colorado: Uncompahgre.	Taylor Park.....	Undetermined.	(19)	(14)	(14)
Idaho:					
Boise.....	Upper Deer Flat <sup>13</sup> .....	Earth fill.....	70	4,000	1,190,275
Do.....	Lower Deer Flat <sup>13</sup> .....	do.....	40	7,200	1,207,606
Do.....	Deer Flat Forest <sup>13</sup> .....	do.....	16	950	22,500
Do.....	Arrowrock <sup>13</sup> .....	Rubble concrete arch, gravity.	349	1,100	585,120
Minidoka.....	Minidoka <sup>12</sup> .....	Rock fill, concrete core.....	86	987	242,500
Do.....	Jackson Lake <sup>13</sup> .....	Massive concrete gate section and earth fill.	67	4,450	345,400
Do.....	American Falls.....	(Concrete gravity.....)	<sup>18</sup> 87	3,100	170,000
Montana:		(Earth embankment.....)	75	1,900	150,000
Milk River.....	Sherburne Lakes <sup>14</sup> .....	do.....	83	1,133	201,500
Do.....	St. Mary Lakes.....	do.....	30	2,000	135,000
Do.....	Nelson <sup>15</sup> .....	do.....	28	9,900	175,000
Do.....	Point of Rocks <sup>13</sup> .....	do.....	12 5	2,680	31,000
Do.....	Connolly.....	do.....	68	3,125	2,019,000
Sun River.....	Willow Creek <sup>16</sup> .....	Earth fill.....	110	1,045	452,000
Do.....	Beaver Creek <sup>16</sup> .....	Masonry.....	205	820	196,000
Do.....	Pishkun <sup>17</sup> .....	Earth fill.....	48	8,600	444,000
Do.....	Muddy Creek.....	do.....	90	800	440,000
Do.....	Benton Lake.....	do.....	40	240	12,000

<sup>11</sup> Contract for smaller dam, with provision for increasing height if desired.<sup>12</sup> Tentative.<sup>13</sup> Completed.<sup>14</sup> Not designed.<sup>15</sup> Completed except permanent spillway.<sup>16</sup> Completed to height of 72.5 feet; crest length, 525 feet; volume, 196,400 cubic yards.<sup>17</sup> Completed to height of 19 feet.

Engineering data for projects when completed—Continued

STORAGE DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Nebraska-Wyoming:	Pathfinder <sup>11</sup> .....	Broken range masonry arch.	218	432	60, 210
North Platte.					
Do	Pathfinder Dike <sup>11</sup> .....	Earth fill.....	40	1, 650	152, 000
Do	Upper Lake Alice <sup>11</sup> .....	do.....	30	3, 100	240, 000
Do	Lower Lake Alice <sup>11</sup> .....	do.....	23	2, 550	119, 000
Do	Minatare <sup>11</sup> .....	do.....	65	3, 700	570, 000
Do	Guernsey.....	Earth and rock fill.....	97	675	332, 000
Nevada: Newlands..	Lake Tahoe <sup>11</sup> .....	Concrete sluiceway regulator	14	109	425
Do	Lohontan <sup>11</sup> .....	Earth and gravel fill with concrete spillways.	124	1, 400	770, 000
Do	Spanish Springs.....	do.....	112	2, 815	1, 700, 000
New Mexico: Carlis-	Avalon <sup>11</sup> .....	Earth and rock fill, concrete core.	50	1, 380	168, 773
bad.					
Do	McMillan <sup>11</sup> .....	Earth and rock fill.....	55	2, 070	150, 744
New Mexico-Texas:	Elephant Butte <sup>11</sup> .....	Rubble concrete, gravity.....	306	1, 155	605, 200
Rio Grande.					
Do	Elephant Butte Dike <sup>11</sup> .....	Earth and rock fill.....	42	2, 000	178, 000
Oregon: Umatilla....	Cold Springs <sup>11</sup> .....	do.....	98	3, 800	789, 500
Do	McKay.....	Earth and gravel fill.....	160	2, 600	2, 300, 000
Oregon: California:	Clear Lake <sup>11</sup> .....	Rock fill.....	33	790	56, 600
Klamath.					
Do	Link River <sup>11</sup> .....	Concrete.....	22	435	2, 200
Do	Gerber <sup>11</sup> .....	Concrete arch.....	85	478	11, 900
South Dakota: Belle	Belle Fourche <sup>11</sup> .....	Earth fill.....	122	6, 200	1, 600, 000
Fourche.					
Utah: Strawberry	Indian Creek Dike <sup>11</sup> .....	Earth fill, reinforced concrete	37	1, 311	101, 107
Valley.					
Do	Strawberry Dam <sup>11</sup> .....	Earth fill, reinforced concrete core wall.	72	488	108, 415
Washington:					
Okanogan.....	Salmon Lake <sup>11</sup> .....	Earth embankment.....	40	1, 260	194, 288
Do	Conconully <sup>11</sup> .....	Hydraulic earth fill.....	67	1, 000	354, 242
Yakima.....	Bumping Lake <sup>11</sup> .....	Earth fill.....	45	3, 425	247, 700
Do	Lake Cle Elum <sup>11</sup> .....	Earth and gravel fill.....	125	700	462, 000
Do	Lake Kachess <sup>11</sup> .....	do.....	63	1, 400	193, 300
Do	Tieton.....	Earth and rock fill, concrete-core wall.	244	905	1, 850, 000
Do	Lake Keechelus <sup>11</sup> .....	Earth and gravel fill.....	70	6, 500	639, 000
Do	Clear Creek <sup>11</sup> .....	Single concrete arch.....	34	404	4, 100
Wyoming: Riverton.	Pilot Butte.....	Earth embankment.....	42	2, 400	200, 000
Do	Bull Lake.....	do.....	75	3, 300	600, 000
Shoshone.....	Shoshone <sup>11</sup> .....	Rubble concrete arch.....	328	200	78, 576
Do	Ralston <sup>11</sup> .....	Earth fill.....	50	2, 200	24, 740
Do	Deaver.....	do.....	14	1, 300	30, 300
Total.....					23, 456, 090

DIVERSION DAMS

			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Arizona: Salt River.	Granite Reef <sup>11</sup> .....	Rubble concrete weir.....	38	1, 000	40, 000
Do	Power Canal <sup>11</sup> .....	do.....	12½	400	4, 800
Do	Joint Head <sup>11</sup> .....	Concrete weir.....	10	600	1, 740
Arizona-California:	Laguna <sup>11</sup> .....	Indian weir, concrete and rock fill. <sup>11</sup>	10	4, 780	441, 732
Yuma.					
California: Orland..	South Canal <sup>11</sup> .....	Concrete on piling, with rock fill.	20	900	2, 886
Do	North side <sup>11</sup> .....	Concrete weir, with removable timber crest.	8	360	270
Do	East Park Feed Canal. <sup>11</sup>	Concrete arch.....	44	154	1, 777
Colorado:					
Grand Valley....	Colorado River Diversion. <sup>11</sup>	Masonry ogee weir with roller crest 10 to 15 feet high.	24	546	25, 682
Uncompahgre.....	Gunnison <sup>11</sup> .....	Crib with rock fill and movable flashboards.	15½	237	3, 200
Do	Montrose and Delta <sup>11</sup> .....	Timber weir with concrete apron sluiceway and cut-off wall.	6.8	68½	172

<sup>11</sup> Completed.

<sup>12</sup> Including spillway and approaches, 1,675 feet.

<sup>13</sup> Including spillway, 619,000 cubic yards.

<sup>14</sup> Present development, rock-fill timber crib; height, 11 ft.; volume, 1,500 cubic yards.

<sup>15</sup> Maximum height 40 feet from bottom of sheet piling to top of dam; water raised 10 feet.

## Engineering data for projects when completed—Continued

## DIVERSION DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
Colorado—Contd.			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Uncompahgre.....	Loutsanhizer <sup>11</sup>	Pile and timber weir.....	8	100	206
Do.....	Selig <sup>11</sup>	Pile and timber weir with concrete sump.	6	96½	—
Do.....	Ironstone <sup>11</sup>	Pile foundation with timber deck and needle flashboards.	8½	58½	—
Do.....	East <sup>11</sup>	Pile and timber weirs, movable flashboards.	( <sup>12</sup> )	144	—
Do.....	Garnet <sup>11</sup>	Rock baskets, faced and surfaced with concrete.	6½	75	500
Idaho:					
Boise.....	Boise River <sup>11</sup>	Rubble concrete weir.....	45	2,246	21,739
Do.....	Black Canyon <sup>11</sup>	Concrete masonry.....	152	1,040	78,844
Minidoka.....	Minidoka <sup>11</sup>	Combined diversion and storage dam. (See Storage.)	—	—	—
Montana:					
Milk River.....	Swift Current <sup>11</sup>	Earth and timber crib.....	13	2,800	86,700
Do.....	St. Mary <sup>11</sup>	Concrete.....	6.5	198	450
Do.....	Chinook <sup>11</sup>	Timber crib rock filled, concrete abutments, movable crest.	25	319	12,000
Do.....	Dodson <sup>11</sup>	Reinforced concrete, automatic movable crest.	34	1,500	11,000
Do.....	Vandalia <sup>11</sup>	Concrete masonry.....	152	212	6,200
Sun River.....	Sun River <sup>11</sup>	Rock-filled, timber weir.	12	700	14,500
Montana-North Dakota: Lower Yellowstone.	Lower Yellowstone <sup>11</sup>	Concrete weir.....	29	300	80,740
Nebraska-Wyoming: North Platte.	Whalen <sup>11</sup>	do.....	12	100	229
Do.....	Horse Creek <sup>11</sup>	do.....	22	171	3,322
Nevada: Newlands.	Truckee River <sup>11</sup>	23 concrete sluiceways.....	20	240	2,707
Do.....	Carson River <sup>11</sup>	Concrete overflow.....	22	280	2,140
Do.....	Spanish Springs.	Combined storage and diversion. (See Storage.)	—	—	—
New Mexico: Carlsbad.	Avalon <sup>11</sup>	Rubble concrete weir.....	10.8	600	2,413
New Mexico-Texas: Rio Grande.	Leasburg <sup>11</sup>	do.....	16.7	303	2,876
Do.....	Mesilla <sup>11</sup>	do.....	4.7	330	1,209
Do.....	Mexican <sup>11</sup>	Rubble masonry.....	17	350	4,346
Do.....	Percha <sup>11</sup>	Rubble concrete.....	2½	400	286
Oregon: Umatilla.	Feed Canal (Echo) <sup>11</sup>	Concrete weir on timber crib.	2.3	175	43
Do.....	Maxwell Canal <sup>11</sup>	do.....	24	800	4,180
Do.....	Three-Mile Falls <sup>11</sup>	Concrete multiple arch.....	40	280	5,530
Oregon - California: Klamath.	Lost River <sup>11</sup>	Hollow reinforced concrete.....	15	204	625
Do.....	Lower Lost River <sup>11</sup>	Reinforced concrete.....	30	515	18,800
Do.....	Malone <sup>11</sup>	Earth, with concrete spillway.	12	280	1,000
Do.....	Miller <sup>11</sup>	do.....	23	400	12,140
South Dakota: Belle Fourche.	Diversion <sup>11</sup>	Concrete weir.....	17	70	1,262
Utah: Strawberry Valley.	Spanish Fork <sup>11</sup>	do.....	17	1,300	15,183
Do.....	Indian Creek Crossing. <sup>11</sup>	Earth.....	4½	50	123
Washington:			8½	500	2,391
Okanogan.....	Salmon Creek <sup>11</sup>	Concrete weir.....	3	110	334
Yakima.....	Sunnyside <sup>11</sup>	Concrete ogee weir.....	—	—	—
Do.....	Tieton Diversion <sup>11</sup>	Concrete and rock-filled crib.	37	2,385	123,880
Wyoming:			18	400	4,951
Riverton.....	Wind River <sup>11</sup>	Concrete weir with earth embankment.	69.5	330	22,119
Shoshone.....	Corbett <sup>11</sup>	Reinforced concrete weir.....	—	—	—
Do.....	Willwood <sup>11</sup>	Concrete gravity, with ogee weir section.	—	—	—
Total.....					1,057,947

<sup>11</sup> Completed.<sup>12</sup> Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.<sup>13</sup> Length, including logway.<sup>14</sup> Will be constructed by irrigation districts. No data available as to type and dimensions.<sup>15</sup> Constructed by Mexican authorities and used jointly.

*Engineering data for projects when completed—Continued*

## IRRIGABLE AREA, PRESENT STATUS

[Subject to revision after classification of land]

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	Withdrawn			Railroad, unsold	Other	
<b>Arizona:</b>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Salt River.....	19,867						216,133	236,000
Gravity system.....	13,412						216,133	229,545
Pumping system.....	6,455							6,455
Arizona-California: Yuma.....	16,714	1,632	33,284		8,200		50,170	110,000
Arizona—								
Valley.....	6,070		1,000				42,930	50,000
Mesa.....	4,444	1,632	31,894				7,040	45,000
California—Reservation.....	6,200		400		8,200		200	15,000
California: Orland-Main.....							20,659	20,659
<b>Colorado:</b>								
Grand Valley.....	12,047	403	11,110				26,440	50,000
Garfield gravity.....	9,517	403	7,080				13,000	30,000
Garfield pumping.....	2,530		4,080				3,440	10,000
Orchard Mesa pumping.....							10,000	10,000
Uncompahgre.....	18,588	1,832	674				74,108	94,302
South.....	2,270	359	37				6,195	8,861
West.....	2,167		12				3,942	6,121
Montrose & Delta.....	5,066	80	31				22,732	27,539
Loutsenhiser.....	218	37					6,317	6,572
Selig.....	4,010	755	480				7,265	12,516
Ironstone.....	1,140	176	20				16,373	17,709
East.....	3,679	425	94				8,669	12,867
Garnet.....	8						2,615	2,623
<b>Idaho:</b>								
Boise.....	67,621		5,560	5,980			374,960	354,111
Arrowrock (Idaho).....	66,382			60			203,759	270,201
Arrowrock (Oregon).....	1,239						5,697	6,936
Notus.....							6,874	6,874
Hillcrest.....			2,230				11,870	14,100
Black Canyon.....			3,330	5,920			46,750	56,000
King Hill.....				535			10,553	10,588
Minidoka.....	66,128	591	106,840	8,999			23,940	236,485
Pumping.....	30,258			788			17,888	48,894
Gravity.....	66,870	591		371			5,782	72,614
North side pumping extension.....			106,840	7,840			320	115,000
<b>Montana:</b>								
Huntley.....	26,172		2,624		393		3,349	32,538
Gravity.....	21,312		1,944		393		3,349	26,998
Pumping.....	4,860		680					5,540
Divisions—								
Pryor.....	23,537		1,902		215		2,757	28,401
Eastern.....	925		42		178		592	1,737
Fly Creek.....	1,720		680					2,400
Milk River.....	29,732		15,611	5,542			94,305	145,190
Chinook division.....	1,941		1,008	1,198			50,754	55,501
Malta division.....	21,833		13,583	3,181			29,113	67,710
Glasgow division.....	5,958		420	1,163			14,438	21,979
Sun River.....	39,909	429	38,026	6,881			26,596	113,841
Sun River Slope.....	700		12,900	1,100			2,300	17,000
Big Coulee.....				356			1,962	2,318
Greenfields.....	24,734		21,915	4,771			20,701	72,121
Mill Coulee.....	3,000		3,000	500			2,000	8,500
Fort Shaw.....	11,475	429	211	154			1,633	13,902
<b>Montana-North Dakota:</b>								
Lower Yellowstone.....	13,676		2,067	986		95	42,525	59,349
Montana.....	7,029		1,060	846		95	29,998	39,028
North Dakota.....	6,647		1,007	140			12,527	20,321
Divisions—								
Gravity.....	13,416		2,011	704		50	40,860	57,041
Pumping.....	260		56	282		45	1,655	2,308
<b>Nebraska-Wyoming:</b>								
North Platte.....	136,677		12,555	2,045			87,793	238,870
Interstate division.....	33,697		1,143	629			29,264	114,633
Nebraska.....	81,066		1,143	529			28,986	111,748
Wyoming.....	2,611						279	2,890
Fort Laramie division.....	45,491		10,871	1,477			50,048	107,837
Nebraska.....	10,425		5,530	246			39,029	55,230
Wyoming.....	35,066		5,341	1,231			11,019	52,657
Northport division, Nebraska.....	7,489		341	39			8,481	16,350

\* Includes 320 acres of vested rights and 171 acres of town and school sites.

## Engineering data for projects when completed—Continued

## IRRIGABLE AREA, PRESENT STATUS—Continued

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	Withdrawn			Railroad, unsold	Other	
<b>Nevada:</b>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Newlands.....	31,223	4,455	26,445	—	23,877	20,000	53,000	139,000
Carson division.....	27,208	4,455	4,825	—	4,877	2,500	39,140	88,000
Truckee division.....	4,020	—	2,120	—	—	2,000	13,860	22,000
Pyramid division.....	—	—	4,500	—	19,000	1,800	—	25,000
Lovelock division.....	—	—	15,000	—	—	14,000	—	29,000
New Mexico: Carlsbad.....	55	—	—	—	—	—	24,964	25,000
New Mexico-Texas:								
Rio Grande.....	1,500	100	700	1,000	—	—	151,700	155,000
New Mexico.....	1,500	100	700	1,000	—	—	87,700	91,000
Texas.....	—	—	—	—	—	—	64,000	64,000
Divisions—								
Rincon.....	—	20	—	700	—	—	15,900	17,000
Leesburg.....	600	40	640	200	—	—	29,950	31,000
Mesilla.....	900	40	60	100	—	—	45,850	47,000
El Paso.....	—	—	—	—	—	—	55,000	55,000
Unallocated.....	—	—	—	—	—	—	5,000	5,000
North Dakota: Williston.....	254	139	—	23	—	—	10,337	10,753
Oregon:								
Umatilla.....	5,413	—	2,376	—	—	3,319	17,192	25,300
East division.....	3,030	—	—	—	—	1,407	12,568	17,000
West division.....	2,383	—	2,376	—	—	1,912	4,629	11,300
Oregon-California: Klamath.....	5,760	—	20,953	—	—	—	140,714	167,427
Oregon.....	2,917	—	1,327	—	—	—	103,166	107,410
California.....	2,843	—	19,626	—	—	—	37,548	60,017
Divisions—								
Main.....	2,752	—	—	—	—	—	39,198	41,950
Tule Lake.....	3,008	—	20,953	—	—	—	230	24,300
Pumping.....	—	—	—	—	—	—	20,595	20,595
Langell Valley.....	—	—	—	—	—	—	20,782	20,782
Bonanza Springs.....	—	—	—	—	—	—	5,900	5,900
Lower Klamath Lake.....	—	—	—	—	—	—	54,080	54,080
South Dakota: Belle Fourche.....	37,696	37	4,508	1,196	—	—	45,329	88,765
Utah: Strawberry Valley.....	1,953	—	—	—	—	—	51,986	53,939
High Line.....	1,953	—	—	—	—	—	19,417	21,370
Spanish Fork.....	—	—	—	—	—	—	22,519	22,519
Springville-Mapleton.....	—	—	—	—	—	—	10,000	10,000
Washington:								
Okanogan.....	116	—	—	—	—	—	7,364	7,500
Gravety.....	—	—	—	—	—	—	—	6,326
Pumping.....	—	—	—	—	—	—	—	1,175
Yakima.....	7,358	—	13,688	5,939	241	21,729	291,032	339,957
Sunnyside.....	2,627	—	—	20	241	—	104,702	107,600
Tieton.....	2,048	—	—	4	—	—	29,948	32,000
Roe.....	120	—	1,523	2,067	—	11,310	43,330	58,250
Moxee.....	1,663	—	775	1,332	—	2,759	30,197	36,759
Kittitas.....	—	—	4,990	1,406	—	3,996	59,955	70,367
Kannewick.....	900	—	6,400	1,100	—	3,700	22,990	35,000
Wyoming:								
Riverton.....	—	—	69,000	—	1,000	—	30,000	100,000
Shoshone.....	62,617	2,293	125,692	18,451	—	687	8,790	215,400
Montana, Frannie division.....	87	—	—	4	—	—	—	91
Wyoming—								
Garland division.....	40,066	891	711	352	—	—	1,961	44,000
Frannie division.....	22,365	1,402	2,969	995	—	687	1,491	29,000
Willwood division.....	—	—	14,312	500	—	—	788	15,600
Heart Mountain division.....	—	—	33,100	3,200	—	—	2,500	38,800
Oregon Basin division.....	—	—	74,600	13,400	—	—	2,000	90,000
<b>Total primary projects.....</b>	<b>630,975</b>	<b>11,911</b>	<b>491,513</b>	<b>57,377</b>	<b>33,711</b>	<b>45,830</b>	<b>1,791,889</b>	<b>3,063,398</b>

<sup>27</sup> 3,000 acres to be allotted to about 600 Indians; remainder of land to be sold in accordance with act (23 Stat., 225).

<sup>28</sup> Includes some public land, but distribution not known.

<sup>29</sup> The 1,500 acres of irrigable area formerly included in the proposed Sanatquin pumping district under the High Line division, have been eliminated from this report.

# SUMMARY OF CONSTRUCTION RESULTS, JUNE 30, 1925

Items	To June 30, 1925		To June 30, 1924		Increase	
Reservoir capacity available (original).....	Acro-feet 10, 325, 053		Acro-feet 10, 018, 993		Acro-feet 306, 060	
CANALS, DITCHES, AND DRAINS						
	Miles		Miles		Miles	
Canals over 800 second-feet capacity.....	517. 5		511. 5		6	
Canals 301 to 800 second-feet capacity.....	712. 61		712. 61		-----	
Canals 50 to 300 second-feet capacity.....	2, 305. 26		2, 270. 52		34. 74	
Canals less than 50 second-feet capacity.....	9, 310. 91		9, 095. 71		214. 20	
Total canals.....	12, 546. 28		12, 581. 34		354. 94	
Waste-water ditches.....	1, 029. 62		982. 40		47. 22	
Drains, open.....	1, 690. 45		1, 498. 75		191. 70	
Drains, closed.....	213. 20		212. 33		. 87	
Total.....	2, 933. 27		2, 693. 48		239. 79	
Grand total.....	15, 779. 55		15, 274. 82		504. 73	
TUNNELS						
Number.....	106		105		1	
Length.....	152, 345		146, 614		5, 731	
STORAGE AND DIVERSION DAMS						
	Cubic yards		Cubic yards		Cubic yards	
Masonry.....	2, 274, 659		2, 238, 901		35, 758	
Earth.....	14, 341, 608		12, 798, 419		1, 543, 189	
Rockfill and crib.....	1, 725, 775		1, 679, 865		45, 910	
Total.....	18, 342, 042		16, 717, 185		1, 624, 857	
DIKES AND LEVERS						
Length and volume.....	Feet 1, 069, 079	Cubic yards 5, 554, 163	Feet 1, 010, 372	Cubic yards 5, 204, 264	Feet 58, 707	Cubic yards 249, 899
	Concrete	Wood	Concrete	Wood	Concrete	Wood
CANAL STRUCTURES						
	Number	Number	Number	Number	Number	Number
Costing over \$2,000.....	1, 461	233	1, 385	229	76	4
Costing \$500 to \$2000.....	3, 188	1, 019	3, 030	909	158	110
Costing \$100 to \$500.....	17, 296	10, 619	16, 275	10, 010	1, 011	609
Costing less than \$100.....	31, 325	75, 032	29, 096	74, 127	2, 229	1, 905
Total.....	53, 260	87, 908	49, 786	85, 275	3, 474	2, 628
Grand total.....	141, 163		135, 061		6, 102	
	Number	Length	Number	Length	Number	Length
BRIDGES						
		Feet		Feet		Feet
Steel.....	112	9, 124	112	9, 124	-----	-----
Combination.....	422	12, 776	422	12, 776	-----	-----
Wood.....	9, 781	226, 541	9, 296	216, 083	483	10, 458
Concrete.....	363	4, 959	361	4, 934	2	25
Total.....	10, 678	253, 400	10, 193	242, 917	485	10, 483
CULVERTS						
Concrete.....	3, 329	166, 019	3, 198	154, 512	131	11, 507
Metal.....	2, 410	85, 257	2, 280	80, 476	130	4, 781
Terre-cotta.....	2, 079	82, 526	2, 006	80, 127	73	2, 399
Wood.....	4, 263	109, 509	4, 228	108, 603	35	906
Total.....	12, 081	443, 311	11, 712	423, 718	369	19, 593



## Summary of construction results, June 30, 1925—Continued

Items	To June 30, 1925		To June 30, 1924		Increase	
<b>PIPE</b>						
	<i>Linear feet</i>		<i>Linear feet</i>		<i>Linear feet</i>	
Concrete.....	988, 431		915, 295		71, 136	
Metal.....	345, 553		319, 608		25, 945	
Terra-cotta (tile).....	1, 682, 756		1, 612, 296		70, 460	
Wood.....	674, 076		660, 596		13, 480	
Total.....	3, 688, 816		3, 507, 795		181, 021	
<b>FLUMES</b>						
	<i>Number</i>	<i>Length (feet)</i>	<i>Number</i>	<i>Length (feet)</i>	<i>Number</i>	<i>Length (feet)</i>
Concrete.....	101	72, 250	100	71, 940	1	310
Metal.....	1, 667	212, 982	1, 509	212, 717	158	265
Wood.....	2, 623	502, 568	2, 546	494, 773	77	7, 785
Total.....	4, 391	787, 790	4, 155	779, 430	236	8, 360
<b>CANALS LINED</b>						
	Concrete	Wood	Concrete	Wood	Concrete	Wood
Length (miles).....	429. 57	484. 57	412. 02	4. 12	17. 55	480. 45
Total.....	914. 14		416. 14		496	
<b>BUILDINGS</b>						
	<i>Number</i>		<i>Number</i>		<i>Number</i>	
Offices.....	101		101		.....	
Residences.....	730		730		.....	
Power plants.....	33		33		.....	
Pumping stations.....	178		178		.....	
Barns, storehouses, etc.....	575		575		.....	
Total.....	1, 617		1, 617		.....	
<b>WELLS</b>						
	<i>Number</i>	<i>Depth</i>	<i>Number</i>	<i>Depth</i>	<i>Number</i>	<i>Depth</i>
Number and depth.....	640	66, 195	629	61, 475	11	4, 720
<b>COMMUNICATIONS</b>						
	<i>Miles</i>		<i>Miles</i>		<i>Miles</i>	
Roads.....	1, 049. 78		1, 044		4. 78	
Railroads.....	83. 00		83		.....	
Telephone lines.....	3, 349. 00		3, 349		.....	
Transmission lines.....	1, 652. 43		1, 295		257. 43	
Total.....	6, 134. 21		5, 871		263. 21	
<b>POWER DEVELOPED</b>						
Water and steam, horsepower.....	75, 079		64, 159		10, 920	
<b>EXCAVATION</b>						
	<i>Cubic yards</i>		<i>Cubic yards</i>		<i>Cubic yards</i>	
Class 1, earth.....	222, 680, 628		212, 634, 084		10, 046, 544	
Class 2, indurated material.....	12, 721, 267		12, 340, 294		380, 973	
Class 3, rock.....	10, 412, 066		9, 906, 851		446, 215	
Total.....	245, 814, 581		234, 940, 179		10, 874, 402	
Riprap (cubic yards).....	2, 407, 545		2, 378, 337		29, 208	
Paving (square yards).....	987, 686		962, 682		25, 004	
Concrete (cubic yards).....	358, 721		3, 450, 251		33, 470	
Cement (barrels).....	3, 670, 211		3, 408, 191		262, 020	

## POWER AND PUMPING

Power plants operated on Bureau of Reclamation projects during the fiscal year 1924-25

Project	Name of plant	Outgoing line voltage	Station capacity	Number of units	Head	First cost of plant	Cost of operation and maintenance	Esti- mated depre- ciation	Cost per kilowatt-hour exclu- sive of depre- ciation	Distribution of kilowatt-hours gener- ated			Total output	Gross power sales
										Sold to con- sumers	Used for irriga- tion purposes	Used for other pur- poses		
Boise	Black Canyon <sup>1</sup> Boise River <sup>2</sup>	Kv-a 68,000 and 22,000	10,000 1,875	2 3	Feet 80-88 33-40	\$305,000.00 187,905.37	\$9,645.63 20,701.29	\$5,540.00 15,012.00	.0027 .000473				Kilowatt- hours ( <sup>3</sup> ) 2,522,800 43,764,400	\$107,942.68
Mimidoka	American Falls (3 plants) Labontian <sup>4</sup>	33,000 and 2,300	1,540 1,575	3 3	38 and 45	76,975.00 141,908.01	5,300.72 12,898.04	200.00 5,000.00	.00254 .0031				119,198,630.23	5,174,509.2,530,700 <sup>5</sup>
Newlands Williston	Williston (steam-elec- tric) <sup>6</sup>	33,000 and 2,300	1,575 1,160	3 4	110 4	175,000.00 175,000.00	72,500.00 2,900.00	3,900.00 .0031					3,932,640 1,126,820	42,351 266,992
North Platte	Lingle <sup>7</sup>	33,000 and 2,300	750 6,600	2 1	105 108	99,824.22 11,923.44	42,161.57 10,200.00	.0193					2,123,965 438,820	516,130 34,252.98
Okanogan	Power Plant No. 1 <sup>8</sup> Power Plant No. 2 <sup>9</sup>	6,600 6,600	187 187	1 1	55	13,931.42								
Rio Grande	Elephant Butte No. 2 <sup>10</sup>	2,300 33,000	187 1,000	1 1	147 90-110	8,440.50 146,496.34	1,930.00 3,348.78	253.00 4,187.00	.0064 .0046	786		29,594	30,380	68.88
Riverton	Pilot Butte <sup>11</sup>	33,000	1,000	1	90-110	146,496.34	3,348.78	4,187.00	.0046	172,139	465,762	92,457	780,358	3,807.53

<sup>1</sup> Under construction.<sup>2</sup> Estimated.<sup>3</sup> Under contract of Apr. 1, 1923, the output is delivered to Idaho Power Co. on exchange basis.<sup>4</sup> These 4 plants operated as a system by the Minidoka project.<sup>5</sup> Labontian plant under 10-year lease to Canyon Power Co., expires in 1924.<sup>6</sup> Two units from Tieton Power Plant No. 2 being installed. Output, cost, and distribution include 962,800 kilowatt-hours purchased from Western Public Service Co. for \$31,492.66.<sup>7</sup> Not operated fiscal year 1924-25.<sup>8</sup> Plant began operations Jan. 8, 1925.

Power plants operated on Bureau of Reclamation projects during the fiscal year 1924-25—Continued

Project	Name of plant	Outgoing line voltage	Station capacity	Number of units	Head	First cost of plant	Cost of operation and maintenance	Estimated depreciation	Cost per kilowatt-hour exclusive of depreciation	Distribution of kilowatt-hours generated				Total output	Gross power sales
										Sold to consumers	Used for irrigation purposes	Used for other purposes	Losses		
Salt River	Arizona Falls	11,000	Kc-a 1,000	2	Feed 19	\$109,500.73	\$10,032.72	\$5,475.04	\$0.00333					Kilowatt-hours 3,025,850 2,535,980 9,764,500 \$705,171.23	
	Chandler	11,000	600	1	40	91,900.84	10,064.05	4,599.54	.00398						
	Cross-Cut	45,000 and 11,000	5,250	6	111	755,147.26	28,711.69	37,757.36	.00294						
	Roosevelt	45,000 and 2,000	10,250	7	80-235	1,235,894.98	115,283.31	61,795.13	.00223	64,754,758	18,216,492	8,031,134	9,837,514		
Shoshone	South Consolidated	45,000 and 2,000	2,000	2	34	163,139.60	12,587.85	8,156.98	.001776					51,698,359	
	Shoshone	23,000 and 2,300	2,000	2	120-220	565,454.00	10,442.31	22,440.00	.00813	251,008		727,171	309,916	7,033,800	9,462.00
Strawberry Valley	Spanish Fork	11,000	1,000	2	123.5	60,724.80	17,754.56	3,033.72	.0119	1,350,216		165,799	74,335	1,400,350	25,823.45
Yakima Storage	Tieton No. 1	2,300	270	2	45	40,000.00									
Yakima Sunny-side	Tieton No. 2	2,300	1,000	2	74	78,895.63	10,518.46	1,505.00	.00413					2,546,130	
	Rocky Ford	6,000	187	1	75	25,000.00	2,500.00	1,055.00	.0037					674,000	

\* Dismantled during the year.

\* Includes transmitted on lines and transformers to the value of \$9,000.

## Pumping plants operated on Bureau of Reclamation projects during fiscal year 1924-25

Project	Name of plant	Type of units	Plant capacity		Num- ber of units	Net lift	First cost of plant	Cost of operation and main- te- nance	Estimated depre- ciation	Energy used for pumping <i>Kilowatt- hour</i>	Acre-feet pumped	Cost per acre-foot without depre- ciation	
			Horse- power	Second- feet								Per acre- foot	Per foot lift
Boise Grand Valley Huntley	Black Canyon	V. T. D. S.	1,244	266	2	285	\$109,213.15	\$4,705.67	\$3,250.00	---	82,447	\$0.057	\$0.0020
	Price Stub	V. T. D. C.	125	25.3	1	31	46,697.33	505.00	1,000.00	---	5,560	.091	.00208
	Ballantine	do	620	56.0	2	45	73,833.33	1,557.56	2,000.00	---	11,690	.133	.00206
	Ballantine auxiliary	O. E. D. C.	---	---	---	---	---	---	---	---	---	---	---
	Dry Lake	V. T. D. C.	75	19.3	1	51	31,173.04	---	---	---	---	---	---
	Tule Lake No. 1 <sup>1</sup>	V. T. D. S.	120	62.8	2	16	24,600.00	300.00	---	---	18,000	.166	.0277
Lower Yel- lowstone. Mindoka	Tule Lake No. 2	do	25	14.2	1	16	---	---	---	---	---	---	---
	Thomas Point	H. T. D. C.	220	40.0	2	31	49,970.43	\$193.45	1,000.00	---	\$3,350	.0578	.00186
	Pumping station No. 1	V. M. D. C.	3,680	803.0	5	20.2	186,020.05	---	---	---	193,200	---	---
	Pumping station No. 2	do	2,560	711.0	4	30.2	184,920.00	\$35,725.71	19,800.00	22,988,700	157,100	.08	.00267
	Pumping station No. 3	do	1,930	433.0	3	29.9	103,106.96	---	---	---	---	---	---
	Boersch Lake	do	200	50.0	2	19.8	32,947.72	---	---	---	---	---	---
Williston	West End	H. M. D. C.	150	40.0	2	21.25	18,745.41	---	1,647.39	---	---	---	---
	A-4 pumping station	Scoop wheel	25	20.0	1	4.5	3,328.42	---	249.63	---	---	---	---
	1817 pumping station	do	10	11.0	1	4.8	3,634.71	( <sup>5</sup> )	272.62	964,974	( <sup>6</sup> )	---	---
	C-2 pumping station	do	---	---	---	---	---	---	---	---	---	---	---
	114 pumping station	H. M. D. C.	7.5	4.0	1	7.5	2,803.97	---	182.25	---	---	---	---
	1812 pumping station	do	5.0	2.0	1	4.0	1,048.76	---	68.57	---	---	---	---
Williston	Pumping station No. 1	S. T. D. C.	490	44.9	3	56 and 21.6	3,035.69	3,035.69	300.00	49,404	569	5.33	.095
	Pumping station No. 2	H. M. D. C.	175	35.0	2	26.6	4,831.13	4,831.13	800.00	76,016	825	5.88	.221
	Pumping station No. 3	do	270	60.0	3	32.0	9,303.99	9,303.99	1,000.00	131,622	1,759	5.28	.166
	Pumping station No. 4	do	100	20.0	1	27.25	8,821.00	2,828.44	500.00	40,876	453	6.24	.23
	---	---	---	---	---	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---	---	---	---	---	---

<sup>1</sup> Type V. M. D. C. = vertical motor-driven centrifugal pump; H. M. D. C. = horizontal motor-driven centrifugal pump; S. T. D. C. = steam turbine-driven centrifugal pump; V. T. D. C. = vertical hydraulic turbine-driven centrifugal pump; H. T. D. C. = horizontal hydraulic turbine-driven centrifugal pump; O. E. D. S. = oil engine driven screw pump; G. E. D. C. = gas engine driven centrifugal pump; V. T. D. S. = vertical hydraulic turbine screw pump; H. M. D. S. = horizontal motor-driven screw pump.

<sup>2</sup> Completed in 1924. Plant cost is field cost only.

<sup>3</sup> Operated only for testing purposes.

<sup>4</sup> Plant put in operation Mar. 1, 1925.

<sup>5</sup> Estimated.

<sup>6</sup> High cost due to pump alterations to increase capacity.

<sup>7</sup> Operated by local irrigation district.

<sup>8</sup> Not available.

<sup>9</sup> No record.

## Pumping plants operated on Bureau of Reclamation projects during fiscal year 1924-25—Continued

Project	Name of plant	Type of units	Plant capacity		Number of units	Net lift	First cost of plant	Cost of operation and maintenance	Estimated depreciation	Energy used for pumping Kilowatt-hour	Acre-foot pumped	Cost per acre-foot without depreciation	
			Horse-power	Second-feet								Per acre-foot	Per foot lift
Newlands	Lake Tahoe (temporary) <sup>10</sup>	G. E. D. C.	175		1	Feet 1.5	\$22,389.61	\$4,082.81			11,000	\$0.253	\$0.255
	Lehontan (temporary)	H. M. D. C.	400	40-60	2	35-45	36,284.62	8,493.61			4,003	1.83	.39
	Dutch Flat Drain No. 1	V. M. D. C.	20		1	52							
North Platte	Dutch Flat Drain No. 2	do	20		1	20	23,368.94	4,800.08	\$3,000.00		751	6.47	.156
	Dutch Flat Drain No. 3	do	40		1	47							
	Duck Lake (new) <sup>11</sup>	H. M. D. C.	50	5.0	1	60	17,201.92	3,664.94		208,566	1,868	1.96	.0827
Okanogan	Government Well No. 1 and 2 <sup>11</sup>	V. M. D. C.	30	2.0	2	51	18,568.21	921.62		49,946	219	4.21	.0625
	Robinson Flat <sup>11</sup>	H. M. D. C.	400	12.0	2	188	30,077.24	10,592.78		562,500	1,449	7.31	.090
	Salmon Lake <sup>11</sup>	G. E. D. C.	275		2	22-35	17,842.16	21,144.48		1140,954	2,223	9.51	.33
Salt River	Dobbin's Pumping Plant	V. M. D. C.	75		1	50	11,301.05	552.58	21.07	270,608	3,448	.1603	.00160
	Chandler division <sup>11</sup>	{ 10 V. M. D. C. } { 1 H. M. D. C. }	1,020		13	26	148,084.21	20,342.11	10,265.80	4,083,275	53,004	.2765	.0105
	High Line <sup>11</sup>	H. M. D. C.	900	60.0	4	47	91,088.90	19,584.54	4,551.94	3,263,517	31,871	.6120	.0130
Yakima Sunnyside	Tempe Pumping Plant <sup>11</sup>	do	150		1	45	5,720.84	6,062.32		877,426	90	.6450	.01435
	Mesa division <sup>11</sup>	V. M. D. C. and S.	600		16	22-08	145,047.84	12,274.28	10,153.95	2,187,521	35,240	.2453	.01577
	Leaven division <sup>11</sup>	V. M. D. C.	60		3		18,328.45	3,048.93	1,282.93	265,428	3,301	.9236	
Phoenix	Phoenix division <sup>11</sup>	V. M. D. C. and S.	745		20	52	172,921.77	19,347.52	12,104.13	3,064,407	54,580	.3540	.00683
	Tempe division <sup>11</sup>	V. M. D. C.	1,065		15	38	109,880.82	19,847.08	7,692.29	4,181,014	54,580	.3719	.00679
	Salt River division <sup>11</sup>	do	880		23	31	175,240.44	20,052.77	12,264.83	3,752,097	53,724	.3825	.01234
San Francisco	San Francisco <sup>11</sup>	H. M. D. C.	100		1	38	20,978.90	1,021.84	3,997.90	263,484	2,526	.4222	.0137
	Tollison division <sup>11</sup>	V. M. D. C. and S.	650		20	27	168,300.75	16,919.33	11,735.25	2,900,324	40,255	.3600	.1476
	Maricopa Garden	V. M. D. C.	75		1	25	12,352.42	1,385.07	8,667.69	30,774	375	.409	.06815
Yakima Sunnyside	Grandview <sup>11</sup>	{ 1 V. T. D. C. } { 2 H. M. D. C. }	365	36 1/2	3	35-78	72,500.00	5,090.00	3,120.00		-12,455	.345	.00422
	Hillcrest <sup>11</sup>	V. T. D. C.	35	1.56	1	108	5,800.00	180.00	300.00		345	.435	.00874
	Little Salpines Mountain <sup>11</sup>	H. T. D. C.	5	1 1/2	1	110	1,102.00	35.00	45.00		80	.228	.00207
Spring Creek	Outlook <sup>11</sup>	V. T. D. C.	800	50 1/2	2	110	92,000.00	3,432.28	2,480.00		15,070	.453	.00431
	Prosper <sup>11</sup>	H. T. D. C.	100	12	1	106	37,998.00	1,618.85	1,500.00		3,550	.327	.00478
	Spring Creek <sup>11</sup>	do	160	11.8	1	90	28,064.00	1,618.85	1,500.00		3,550	.327	.00478
Yuma	Spring Creek <sup>11</sup>	V. T. D. C.	500	14.26	2	200	48,500.00	2,338.75	1,500.00		6,514	.364	.00177
	Salpines Mountain <sup>11</sup>	{ 1 V. M. D. C. } { 2 H. M. D. C. }	1,100	106	3	70	196,534.11	17,212.29	900.00	917,862	14,973	4.56	.065

Reservation.....	G. E. D. C.....	110	50	2	0-6	6,775.00	(12)	2,500.00	\$504,212	\$48,097	.486	.0413
Valley drainage.....	{1-O. E. D. S.....	525	138-207	3	8-14	191,068.91	\$21,423.64	50.00			5.95	.85
West Yuma pumping.....	{2-H. M. D. S.....	35	-----	1	7	900.00	\$446.34	50.00				
	G. E. D. C.....											

\* Estimated.

† Operated by local irrigation district.

‡ Operated 2 months at Lake Tahoe and 3¼ months at Lahontan.

§ Power purchased from Washington Power Co. An additional 125-horsepower motor and pump operated during portion of 1924.

|| Gallons of distillate.

|| Partial first cost.

|| Operated by Salt River Valley Water Users Association.

|| Not operated.

## Principal contracts for sale of power in force June 30, 1925

Project	Contractor	Date of contract	Date of expiration	Maximum load	Gross rate per kilowatt-hour	Minimum monthly payment	Gross income fiscal year 1924-25	Remarks
Boise	Idaho Power Co.	Apr. 1, 1923	Mar. 31, 1926	Kilowatts 1,875	Cents	None	\$11,000.00	Available load divided between contractor and Minidoka project.
Minidoka	Amalgamated Sugar Co.	May 1, 1922	Feb. 28, 1926	57	4 to 1 1/2	\$2 gross per kilowatt.	42,245.86	
	City of Burley	Jan. 15, 1920	Jan. 1, 1930	2,468	4 to 1 1/2	do.	24,047.57	
	East End Electric Co.	do.	do.	1,890	4 to 1 1/2	do.	1,020.78	
	Perry Light & Power Co.	Jan. 23, 1918	Jan. 23, 1928	20	4 to 1 1/2	do.	1,077.81	
	Minidoka Irrigation district.	Mar. 12, 1919	Mar. 12, 1929	20	4 to 1 1/2	do.	2,864.93	Used for irrigation pumping.
	Paul Electric Co.	Dec. 2, 1916	Indefinite.	270	0.3	do.	6,305.22	Light and power.
	Rural Electric Co.	Feb. 4, 1924	Mar. 31, 1934	261	4 to 1 1/2	\$2 gross per kilowatt.	1,124.12	
	Unity Electric Co.	Mar. 19, 1917	Mar. 31, 1927	24	4 to 1 1/2	do.	2,713.26	
	Utah Construction Co.	do.	Mar. 19, 1927	62	4 to 1 1/2	do.	1,980.22	Power used starting Apr. 20, 1925, for American Falls Dam construction.
	Utah Construction Co.	Jan. 23, 1925	June 30, 1927	200	3 to 0.9	\$1.80 per horsepower		Electric heat.
Newlands	Village of Albion	Oct. 15, 1915	Jan. 8, 1926	80	3 to 0.9	\$2 gross per kilowatt.	5,532.78	
	do.	Sept. 18, 1916	do.	314	Flat rate.	\$1.25 per kilowatt.	2,324.27	
	Village of Deelo	Oct. 26, 1920	Nov. 1, 1930	45	4 to 1 1/2	\$2 gross per kilowatt.	2,084.70	
	Village of Hoyburn	Mar. 9, 1920	Jan. 1, 1930	118	4 to 1 1/2	do.	1,816.45	
	Village of Minidoka	Feb. 5, 1925	Apr. 1, 1934	17	4 to 1 1/2	do.	3,960.00	
	59 small contracts.			160	4 to 1 1/2	\$2 gross per kilowatt.	7,666.47	
	Canyon Power Co.	Jan. 29, 1922	Nov. 30, 1934	1,500	0.4 to 0.3	\$1.200 April to September, inclusive.	13,979.99	Each less than \$1,000.
Williston	City of Williston	Sept. 26, 1922	Sept. 26, 1932	600	5 1/2 to 2	\$3.300.	46,588.00	New contract not completed.
North Platte	City of Mitchell, Nebr.	May 1, 1925	June 30, 1929	135	8 to 1	\$202.80	10,821.12	
	City of Torrington, Wyo.	May 10, 1925	May 10, 1929	125	8 to 1	\$187.50	10,674.57	
	Platte Valley Power Co.	May 1, 1922	May 1, 1929	25	8 to 1	\$37.50	1,466.91	
	Security Land Co.	Feb. 9, 1922	Feb. 9, 1927	25	8 to 1	\$37.50	1,744.06	
	Town of Lingle, Wyo.	Nov. 29, 1924	June 30, 1929	30	8 to 1	\$175.	2,806.50	
	Village of Morrill, Nebr.	May 1, 1925	do.	65	8 to 1	\$22.50	4,528.21	
	Town of Guernsey, Wyo.	Sept. 27, 1924	do.	125	8 to 1	\$500.	1,162.02	
	Town of Wheatland, Wyo.	Sept. 11, 1924	do.	140	8 to 1	\$500.	1,771.70	
Riverton	F. H. Roberts	May 20, 1925	May 19, 1930	140	8 to 1	\$500.	3,807.53	
Shoshone	Town of Powell, Wyo.	Sept. 26, 1923	Sept. 30, 1926	75	6 to 1	\$112.50	6,649.60	
	Chicago, Burlington & Quincy R. R. Co.	June 1, 1923	Jan. 11, 1924	20	6 to 1	\$30.	1,541.59	
	Spanish fork city	May 1, 1925	Apr. 30, 1928	185	6 to 1 1/2	\$740.	10,427.62	
Strawberry Valley	Payson city	Feb. 4, 1925	Feb. 3, 1928	125	6 to 1 1/2	\$500.	8,540.21	
	Salem city	do.	do.	30	6 to 1 1/2	\$120.	1,820.12	
	Springville city	June 15, 1923	July 26, 1926	125	2 to 1	\$30.	3,348.79	

# DRAINAGE

Estimate of seepage and summary of drainage work to June 30, 1925

State and project	Constructed drains <sup>1</sup>		Estimated area damaged by seepage on June 30, 1925	Estimated area protected by constructed drains	Estimated area that will be protected when all drains authorized have been constructed
	Open	Closed			
	Miles	Miles	Acres	Acres	Acres
Arizona: Salt River <sup>1</sup> .....	15.85	5.30	-----	60,000	60,000
Arizona-California: Yuma—					
Reservation.....	11.70	4.00	-----	8,000	8,000
Yuma Valley.....	37.80	-----	500	81,500	50,000
Colorado: Grand Valley—					
Project lands.....	35.08	0.48	400	5,220	6,000
Grand Valley drainage district.....	38.30	1.00	20,000	10,000	10,000
Teller Institute.....	2.80	-----	-----	800	300
Frey drain.....	1.60	-----	-----	300	800
Orchard Mesa.....	9.06	.24	500	1,800	1,800
Uncompahgre <sup>1</sup> .....	-----	97.00	17,600	9,600	9,600
Idaho: Boise—					
Riverside irrigation district.....	44.10	-----	350	11,400	11,400
Pioneer irrigation district.....	78.50	.40	300	30,000	30,000
Nampa-Meridian irrigation district.....	45.76	-----	400	51,000	51,000
Other parts.....	61.44	.10	3,000	10,600	17,200
King Hill <sup>1</sup> .....	.88	-----	180	800	800
Minidoka—					
Gravity division.....	110.70	-----	1,400	30,000	30,000
Pumping division.....	-----	-----	2,000	-----	-----
Montana: Huntley.....	16.73	60.60	1,200	21,600	21,600
Milk River—					
Malta division.....	2.30	-----	2,300	800	800
Glasgow division.....	-----	-----	200	-----	-----
Sun River—					
Fort Shaw division.....	-----	-----	2,872	-----	-----
Grenfields division.....	21.40	-----	50	11,600	11,600
Montana-North Dakota: Lower Yellowstone.....	5.00	1.10	4,000	1,600	1,600
Nebraska-Wyoming: North Platte—					
Interstate division.....	41.62	12.48	2,400	8,000	8,200
Interstate division <sup>1</sup> .....	43.26	-----	-----	-----	-----
Fort Laramie division <sup>1</sup> .....	124.64	-----	700	16,000	18,000
Northport division.....	8.06	-----	50	1,800	2,600
Nevada: Newlands—					
Carson division.....	161.08	3.99	-----	77,900	* 91,392
Truckee division.....	10.84	-----	-----	3,470	* 13,940
New Mexico: Carlsbad.....	11.14	3.65	5,400	5,140	5,140
New Mexico-Texas: Rio Grande—					
Rincon division.....	26.57	-----	5,000	9,000	14,000
Leasburg division.....	66.34	-----	3,000	81,000	81,000
Mesilla division <sup>1</sup> .....	119.11	-----	5,000	47,000	47,000
El Paso division <sup>1</sup> .....	121.39	-----	8,000	58,000	58,000
Oregon: Umatilla.....	13.25	-----	350	3,000	3,000
Klamath—					
Main division.....	108.00	8.00	2,000	28,700	30,000
Tule Lake division.....	52.00	-----	200	12,000	24,000
South Dakota: Belle Fourche.....	-----	-----	10,000	-----	-----
Utah: Strawberry Valley <sup>1</sup> .....	18.90	71.50	8,500	11,422	19,922
Washington: Yakima—					
Sunnyside division <sup>1</sup> .....	82.85	95.07	9,000	51,298	51,298
Tieton division <sup>1</sup> .....	7.50	2.30	200	2,400	2,400
Wyoming: Shoshone—					
Garland division.....	105.06	111.81	2,400	32,000	34,000
Framme division.....	75.94	-----	2,100	10,500	12,000
Willwood division.....	10.51	-----	-----	8,000	3,000
Total.....	1,736.50	* 468.92	129,952	700,960	789,892

<sup>1</sup> Surface drains and waste ditches not included.

<sup>2</sup> Drainage is largely by means of pumps, water recovered being used for irrigation purposes.

<sup>3</sup> Constructed by landowners, water users, or drainage districts.

<sup>4</sup> Outlet channels, of which 7.74 miles were built by the United States as part of the project drainage, 17.35 miles by the United States under cooperative contracts, 16.17 miles by the Farmers' Irrigation district, and 2 miles by the Morrill drainage district.

<sup>5</sup> Outlet channels, of which 56.66 miles were built by the United States as a part of the project drainage and 5.25 miles by the United States under cooperative contract.

<sup>6</sup> Area benefited.

<sup>7</sup> Abandoned temporary outlets not included.

<sup>8</sup> All drainage work done by county drainage engineer through drainage improvement districts.

<sup>9</sup> Decrease in length of closed drains due to opening 2.12 miles of closed drains on North Platte project.



# SETTLEMENT DATA

State and project	Irrigated farms		Towns		Number of schools, project and towns	Number of churches
	Number	Population	Number	Population		
Arizona: Salt River.....	6,300	39,000	12	55,000	66	66
Arizona-California: Yuma.....	1,460	3,600	5	6,900	17	15
California: Orland.....	673	1,750	1	1,700	10	7
Colorado:						
Grand Valley.....	453	1,215	6	11,246	24	33
Uncompahgre.....	1,599	5,822	3	7,400	28	27
Idaho:						
Boise.....	3,500	10,800	10	26,000	48	58
King Hill.....	188	655	4	1,818	6	5
Minidoka.....	2,453	7,197	6	6,920	28	30
Montana:						
Huntley.....	557	1,822	8	530	8	9
Milk River.....	171	743	15	7,025	24	35
San River.....	441	1,059	8	2,397	17	11
Montana-North Dakota: Lower Yellowstone.....	390	1,567	8	2,560	16	15
Nebraska-Wyoming: North Platte.....	2,274	6,340	18	18,900	103	60
Nevada: Newlands.....	762	2,668	5	2,300	11	9
New Mexico: Carlsbad.....	412	2,060	4	3,446	8	12
New Mexico-Texas: Rio Grande.....	4,800	28,000	42	106,000	75	120
North Dakota: Williston.....	60	215	2	4,400	7	7
Oregon: Umatilla.....	534	1,529	4	1,280	6	9
Oregon-California: Klamath.....	600	1,800	5	7,006	24	13
South Dakota: Belle Fourche.....	854	2,020	5	2,350	27	9
Utah: Strawberry Valley.....	2,741	6,500	12	16,300	24	26
Washington:						
Okanogan.....	453	1,261	8	3,000	7	9
Yakima-Sunnyside.....	3,391	9,617	11	7,410	41	30
Yakima-Tieton.....	1,300	3,480	8	26,000	10	4
Wyoming:						
Riverton.....			2	2,500	2	7
Shoshone.....	820	1,960	5	1,400	7	8
Total.....	37,186	142,690	208	337,336	935	633

<sup>1</sup> Includes "Consolidated B" school district at Fallon, counted as 1 school but originally embracing 7 or more school districts.

<sup>2</sup> Includes Yakima and Naches, 22,000.

## Settlement data—Continued

State and project	Banks				New settlers purchasing or leasing land	Number of settlers and tenants who left during year
	Number	Capital stock	Deposits	Number of depositors		
Arizona: Salt River.....	15	\$1,600,000	\$26,580,000	41,000	-----	-----
Arizona-California: Yuma.....	5	280,000	2,664,300	8,492	18	30
California: Orland.....	2	171,000	1,041,000	2,950	25	30
Colorado:						
Grand Valley.....	6	445,000	3,927,300	12,600	60	30
Uncompahgre.....	6	506,136	3,301,367	11,250	10	100
Idaho:						
Boise.....	13	1,390,000	17,639,000	31,000	100	100
King Hill.....	1	20,000	286,315	950	9	9
Mindoka.....	5	200,000	1,400,000	4,000	50	100
Montana:						
Huntley.....	2	50,000	192,180	750	25	25
Milk River.....	17	675,000	5,086,000	10,300	43	(1)
Sun River.....	3	60,460	147,000	586	15	20
Montana-North Dakota: Lower Yellow-stone.....	6	150,000	880,130	2,778	-----	-----
Nebraska-Wyoming: North Platte.....	19	582,500	7,116,579	19,400	68	21
Nevada: Newlands.....	1	75,000	851,639	1,700	25	10
New Mexico: Carlsbad.....	2	85,000	525,000	1,350	14	19
New Mexico-Texas: Rio Grande.....	8	2,000,000	26,500,000	30,000	400	(1)
North Dakota: Williston.....	2	150,000	1,650,000	3,000	2	-----
Oregon: Umatilla.....	1	25,000	250,000	1,200	50	50
Oregon-California: Klamath.....	5	355,000	4,000,000	8,200	-----	-----
South Dakota: Belle Fourche.....	4	135,000	2,125,000	6,000	10	40
Utah: Strawberry Valley.....	5	235,000	1,500,000	7,290	-----	-----
Washington:						
Okanogan.....	4	140,000	1,226,000	2,400	30	28
Yakima-Sunnyside.....	10	285,000	2,577,944	9,239	150	100
Yakima-Tieton.....	* 1	-----	-----	-----	175	150
Wyoming:						
Riverton.....	5	135,000	1,000,000	2,900	-----	-----
Shoshone.....	3	85,000	366,000	1,473	-----	35
Total.....	181	9,940,086	111,622,635	220,667	1,279	897

<sup>1</sup> Number of owners and tenants who left project can not be accurately determined but there were very few.

\* Only 1 small bank at Tieton which handles a small per cent of business.

## CROP STATISTICS

Summary of crop reports on Government reclamation projects in 1924—Area (acres)

State and project	Cereals					Other grain and seed					Hay and forage								
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sor- ghum grain	Flax seed	Mid- let seed	Total	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage	Pasture	Total
Arizona: Salt River	9,607				6,254	15,861	11,507					12,945	65,368		4,513		10,589	42,945	123,415
Arizona-California: Yuma	74	51	31		509	665			1,438			138	17,512		10,086			1,922	29,564
California: Orland	225		2		84	311			138				5,694		239	25	18	1,528	7,504
Colorado:																			
Grand Valley		736	544		675	1,955	192					192	5,995		38	682	2,527	243	9,485
Uncompahgre	127	2,475	4,469	23	6,785	13,889	552	71				623	25,528	179	315	222	456	4,824	31,114
Odaho:																			
Boise	6,137	7,086	2,899	37	15,437	31,596	966	3,520	3	11	5	4,505	47,458	5,083	1,024	1,579	973	13,373	69,490
King Hill	49	339	41		182	611	760	16				776	3,875	20		26		33,370	4,801
Minidoka—																			
Gravity division	2,216	3,304	1,104	21	3,819	10,464	111	358				469	22,654	1,455	75	266		5,229	29,709
Pumping division	2,229	471	795		4,720	8,215	25	1,318				1,343	15,608	745		200		3,051	19,694
Montana:																			
Humbley	222	936	912	7	2,212	4,309	56	228			6	280	5,724	65	12	398	1	14,944	21,144
Milk River	20	311	808		1,036	2,175	115				99	214	3,606		2,298	35	520	63	11,522
Sun River—																			
Fort Shaw division	104	60	325	12	677	1,178		10				10	5,010	89	128	294	2	1,074	6,597
Greenfields and Big Coulee divisions																			
Montana-North Dakota: Lower Yellowstone	467	2	1,424		15,424	17,317		103		34		137	3,140	330	705	525		187	4,887
Nebraska-Wyoming:																			
North Platte—	159	370	316	2	90	937		10		52		62	4,275	38	122	292		271	5,998
Interstate division																			
Fort Laramie division	7,642	17,472	4,265	217	2,080	31,676		1,016			101	1,117	23,355	576	395	109		3,472	27,907
Northport division	2,396	9,270	6,590		4,345	22,601						8,287	8,287	257				8,544	1,157
Nevada: Newlands	546	4,015	1,279	91	600	6,531						908	31,820		249		14,370	3,625	49,472
New Mexico: Carlisle	297	259	62		4,081	4,699						1,228	4,596		157			3,595	4,821
New Mexico: Texas: Rio Grande																			
North Dakota: Williston	50	3,303	95	1	463	4,112	41					41	25,411	4	2,033	520	1,233	4,592	33,743
Oregon: Umatilla	5	1	30		35	71						18	25,280		172	31	453	1,058	1,058
Oregon-California:	3	250	3		82	338	2					2	9,698		79	61		1,776	11,614
Klamath—																			
Main division	420		940	250	1,320	2,930							16,900		1,020			11,100	27,620
Tule Lake division			80		30	110							520		140			377	1,037

South Dakota: Belle Fourche.....	553	8, 638	3, 229	689	12, 109	1, 111	49	94	1, 244	21, 825	130	1, 402	1, 402	5, 832	9, 822	34, 581
Utah: Strawberry Valley.....	769	147	1, 735	7, 494	10, 165	63	---	---	68	15, 159	205	2, 022	166	---	3, 456	26, 860
Washington: Okanogan.....	---	12	---	---	12	---	---	---	---	359	---	3	17	---	34	413
Yakima.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sunnyside division.....	312	5, 417	608	3, 953	10, 290	---	---	---	---	35, 033	---	726	92	436	8, 291	47, 578
Tieton division.....	454	1, 020	271	1, 278	3, 023	---	92	---	92	9, 615	---	520	119	283	2, 761	13, 298
Wyoming: Shoshone.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Garland division.....	705	290	2, 105	1, 985	5, 025	---	325	---	342	16, 059	71	167	123	2, 218	2, 335	21, 553
Franklin division.....	53	215	609	322	1, 199	140	290	---	430	3, 575	---	94	34	353	446	4, 502
Total.....	35, 871	66, 410	35, 571	661	86, 861	225, 374	16, 859	7, 406	1, 579	298	129	28, 271	457, 967	9, 247	39, 874	600, 592

## Fruits and nuts

State and project	Vegetables and truck											Fruits and nuts				Miscellaneous	Total
	Beans	Onions	Potatoes (white)	Potatoes (sweet)	Truck	Total	Apples	Peaches	Pears	Prunes	Citrus fruit	Small fruit					
Arizona: Salt River.....	311	521	242	---	10, 067	11, 141	---	---	---	---	2, 228	1, 328	1, 573	5, 129	---		
Arizona-California: Yuma.....	---	80	---	---	509	509	---	---	---	---	9	20	117	1, 146	---		
California: Orland.....	---	---	4	---	1	1	---	---	---	---	256	304	197	1, 617	2, 439		
Colorado: Grand Valley.....	810	43	744	---	244	1, 800	---	243	---	---	---	---	---	243	243		
Uncompahgre.....	1, 436	1, 893	7, 624	---	310	11, 253	1, 727	73	4	2	---	69	---	1, 876	---		
Idaho: Boise.....	233	122	5, 108	4	439	5, 911	1, 698	121	19	964	---	99	---	---	---		
King Hill.....	27	1	238	---	110	376	335	17	27	6	---	---	---	---	---		
Mindooka--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Gravety division.....	1, 212	20	3, 121	---	615	4, 968	63	---	---	---	---	14	---	77	---		
Pumping division.....	233	8	3, 430	---	926	4, 597	---	---	---	---	---	10	---	10	---		
Montana: Huntley.....	540	2	21	---	149	712	---	---	---	---	---	---	---	---	---		
Milk River.....	330	---	56	---	32	418	---	---	---	---	---	1	---	---	1		
Sun River.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Fort Shaw division.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Greenfields and Big Coulee divisions.....	65	---	173	---	56	294	---	---	---	---	---	---	---	---	---		
Montana-North Dakota: Lower Yellowstone.....	20	---	46	---	43	109	---	---	---	---	---	---	---	---	---		
Nebraska: Wyoming.....	136	---	110	---	122	368	---	---	---	---	---	---	---	---	---		
North Platte--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Interstate division.....	186	---	5, 051	---	293	5, 530	---	---	---	---	---	---	---	---	---		
Fort Laramie division.....	---	---	1, 226	---	---	1, 226	---	---	---	---	---	---	---	---	---		
Northport division.....	---	---	64	---	45	109	---	---	---	---	---	---	---	---	---		
Nevada: Newlands.....	2	---	273	---	964	1, 269	---	---	---	---	---	---	---	---	---		
New Mexico: Carlsbad.....	---	---	---	3	---	3	---	---	---	---	---	---	---	---	---		
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10		

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project where data are for corresponding "agricultural year" October, 1923, to September, 1924.

<sup>2</sup> Figures on Boise and Strawberry Valley projects include a portion of the acreage served under Warren Act for which a crop census was taken.

<sup>3</sup> Duty of water from reclamation canals average 0.61 acre-foot per acre; 77 farms more than 50 per cent irrigated; 94 farms less than 50 per cent irrigated.

## Summary of crop reports on Government reclamation projects in 1924—Area (acres)—Continued

State and project	Vegetables and truck						Fruits and nuts							
	Beans	Onions	Potatoes (white)	Potatoes (sweet)	Truck	Total	Apples	Peaches	Pears	Prunes	Citrus fruit	Small fruit	Miscellaneous	Total
New Mexico—Texas: Rio Grande.....	270	50	.....	300	4,195	4,833	412	197	791	.....	.....	398	9	1,777
North Dakota: Williston.....	.....	2	28	.....	20	59	.....	.....	.....	.....	.....	2	.....	2
Oregon: Umatilla.....	.....	.....	66	.....	168	234	455	21	7	17	.....	19	5	524
Oregon—California:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Klamath—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Main division.....	.....	.....	440	1	128	568	2	.....	.....	.....	.....	.....	.....	2
Tule Lake division.....	.....	.....	10	.....	3	13	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota: Belle Fourche.....	.....	.....	81	.....	143	224	.....	.....	.....	.....	.....	.....	.....	.....
Utah: Strawberry Valley.....	13	11	414	.....	208	644	157	387	2	1	.....	69	.....	616
Washington:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Okanogan.....	.....	.....	28	.....	62	90	3,525	3	52	1	.....	16	.....	3,597
Yakima—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sunnyside division.....	190	.....	6,587	.....	2,345	9,122	9,220	762	1,532	416	.....	908	.....	12,866
Tieton division.....	398	51	907	.....	112	1,468	7,160	640	1,772	.....	.....	350	.....	9,822
Wyoming:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shoshone—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garland division.....	1,046	.....	1,481	.....	88	2,615	34	.....	.....	.....	.....	6	.....	40
Frannie division.....	70	.....	120	.....	50	240	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	7,537	2,762	37,698	316	22,474	70,787	24,801	2,398	4,234	1,683	2,541	3,475	3,323	42,455
State and project	Miscellaneous				Irrigated, no crop		Irrigated, no crop							
	Beets, sugar	Cotton	Cane	Other	Total	Duplicated	Total cropped	Young alfalfa	Young fruit	Fall plowing	Miscellaneous	Duplicated	Total irrigated	
Arizona: Salt River.....	107,505	.....	.....	93	107,598	47,714	215,430	.....	808	.....	17,262	.....	233,500	
Arizona—California: Yuma.....	32,240	.....	.....	.....	32,240	23,029	53,120	.....	.....	.....	60	.....	53,180	
California: Orland.....	.....	.....	.....	.....	.....	417	9,970	214	1,704	.....	107	25	11,970	
Colorado:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Grand Valley.....	2,580	.....	.....	1,340	3,940	5,015	12,400	653	10	855	5	993	13,460	
Uncompahgre.....	5,824	.....	.....	330	6,264	2,917	62,100	2,206	63	2,498	449	5,133	62,180	
Idaho:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Boise.....	.....	.....	1	71	72	3,445	111,050	278	788	1,555	1,767	1,808	113,930	
King Hill.....	.....	.....	.....	.....	.....	372	6,070	170	.....	.....	.....	.....	6,240	

Minnesota—	4,590	172	4,771	118	50,340	437	5,400	55,800
Gravity division.....	6,951		6,951		40,720		2,243	48,400
Pumping division.....								
Montana—								
Huntley.....	5,929	3	10,016	16,691	19,770			170
Milk River.....	230		230	30	14,530	368	50	14,600
Sun River.....							3	351
Fort Shaw division.....	61		61		48,140			7,890
Grasslands and Big Coulees division.....					22,450			13,740
Montana-North Dakota: Lower Yellowstone.....	6,590	75	6,665		14,030			14,030
Nebraska-Wyoming: North Platte.....								
Interstate division.....	14,320	246	14,680		80,910			85,850
Fort Laramie division.....	6,770	2,577	9,347	2,668	30,900	2,456	2,484	30,000
Northport division.....	997	376	1,373		9,170			9,170
Nevada: Newlands.....				15,170	40,760		3,530	44,290
New Mexico: Christoval.....		111	18,235	1,227	23,070	132	1,268	24,460
New Mexico-Texas: Rio Grande.....		126	58,800	1,226	103,120		12,880	116,000
North Dakota: Williston.....		3	445	473	1,180			1,180
Oregon: Umatilla.....	442	31	31	253	12,510	405	184	13,136
Oregon-California: Klamath.....						57		26
Main division.....		400	400		31,520		4,490	36,000
Tule Lake division.....		30	30		1,190		1,210	2,400
South Dakota: Belle Fourche.....	1,281	71	1,352	700	49,810			48,400
Utah: Strawberry Valley.....	7,568	856	8,424	5,732	41,040	207	1,816	43,320
Washington: Okanogan.....								
Yakima.....		73	73	285	3,960	6	500	4,940
Sunnyside division.....	272	820	1,092	2,808	78,130	2,039	1,486	86,000
Tieton division.....		117	117	3,370	24,550	5,145	11,570	27,970
Wyoming: Shoshone.....								265
Garland division.....	2,441	4,684	6,925	6,900	29,900	345	576	2,655
Franklin division.....	356	1,295	1,651	1,302	6,720	9	21	286
Total.....	67,128	18,001	301,883	140,702	1,216,510	10,069	49,344	1,290,890

\* Duty of water from reclamation canals, average 0.61 acre-feet per acre; 77 farms more than 50 per cent irrigated; 94 farms less than 50 per cent irrigated.

\* Considerable area cropped without irrigation.

## Summary of crop reports on Government reclamation projects in 1924.—Total yields.

State and project	Cereals					Other grains and seed						Hay and forage						
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax seed	Millet seed	Total	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage	Total
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Tons	Tons	Tons	Tons	Tons	Tons
Arizona: Salt River	380,277				177,203	557,480						101,460	285,100	12,940	47,790			345,830
Arizona-California: Yuma	1,756	1,275	837		14,233	18,101	59,860			41,000		3,560	42,738	9,290	130			52,150
California: Orland	3,500		50		950	4,500				3,560			7,338	212	53			7,639
Colorado:																		
Grand Valley		12,035	13,019		13,546	38,620		572				572	17,100			2,705		19,805
Uncompaggre	1,788	45,700	123,670	965	178,602	350,715	1,446	158				1,604	56,515	206	367	544	274	57,906
Idaho:																		
Boise	283,490	167,656	89,670	492	412,772	934,080	1,760	8,983			25	10,738	90,334	6,458	980	5,762	2,035	105,569
King Hill	2,470	9,457	1,625		4,012	17,564	4,435	121				4,556	13,127	41	15	42		13,225
Mindoka																		
Gravety division	65,420	73,000	35,845	410	95,445	270,120	270	1,394				1,664	63,440	3,640	112	1,186		68,378
Pumping division	51,360	7,070	23,370		106,170	187,970	66	3,536				3,602	36,360	936		490		37,786
Montana:																		
Huntley	8,886	15,500	34,154	154	53,386	112,170	54	922			12	988	13,500	170	10	1,040	10	13,730
Milk River	300	3,715	18,200		10,475	38,690	46				628	674	7,495			5,760	105	13,360
Sun River																		
Fort Shaw division	2,594	1,030	8,056	200	10,110	21,990		85				85	8,418	120	153	577	16	9,284
Greenfields and Big-Coulee division	6,682	50	30,604		157,084	195,020		782			133	915	5,442	415	455	782		7,094
Montana-North Dakota, Lower Yellowstone	5,110	8,845	13,585	60	2,250	29,850		30			570	600	11,210	46	200	663		12,119
Nebraska-Wyoming:																		
North Platte																		
Interstate division	205,240	282,470	127,363	2,136	30,951	648,190		1,433			687	2,120	41,288	418	327	307		42,430
Fort Laramie division	54,665	136,170	201,912		87,773	480,550							10,760					10,760
Northport division	10,980	46,560	32,555	692	10,643	101,430							92,600		260			92,920
Nevada: Newlands	8,670		3,875		89,735	102,280							15,330					15,330
New Mexico: Carlisbad							8,110						153					153
New Mexico-Texas: Rio Grande	1,810	83,400	2,600	10	13,590	101,410	183					230	82,130	10	5,200	3,250	3,070	93,660
North Dakota: Williston	200	50	4,530		810	2,590							843		322	155	20	1,340
Oregon: Umatilla	100	6,502	1,130		1,198	7,930	7						27,345		75	410		27,890
Oregon-California:																		
Klamath																		
Main division	9,230		17,600	2,720	24,940	54,390							40,600		1,380			41,980
Tule Lake division			2,270		570	2,840							1,650		90			1,740
South Dakota: Belle Fourche	11,858	127,848	85,610		11,724	237,040	532	175			395	1,102	30,890	365	1,200	3,345		33,700
Utah: Strawberry Valley	24,435	4,010	64,930		184,915	278,280	130					130	47,035	335	2,095	1,275	1,180	53,420

	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
<b>Washington:</b>											
Okanogan	306	231,876	80,420	342,300	306	497	4	90	---	---	600
Yakima	---	---	---	---	---	---	---	---	---	---	---
Sunnyside division	11,614	28,450	80,420	342,300	---	140,296	1,075	430	5,550	---	147,350
Tyler division	11,955	38,145	29,900	88,790	380	380	600	200	2,530	---	20,070
<b>Wyoming:</b>											
Shoshone	---	---	---	---	---	---	---	---	---	---	---
Cardiac division	20,300	3,697	42,810	132,920	1,360	126	1,485	163	243	---	30,870
Franklin division	780	2,866	4,300	21,210	1,230	1,376	6,104	33	34	3,160	9,300
<b>Total</b>	1,165,600	1,297,331	1,051,648	7,829,187	6,373,375	77,044	21,131	45,160	1,956	840,145	1,400,035

Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year" October, 1923, to September, 1924. Figures on Boise and Strawberry Valley projects include yields from crops grown on portions of land served under Warren Act for which a crop census was taken.

Summary of crop reports on Government reclamation projects in 1924.—Total yields.—Continued

State and product	Fruits and nuts							Total
	Apples	Peaches	Pears	Prunes	Citrus fruit	Small fruit	Miscellaneous	
Arizona: Salt River								Pounds
Arizona-California: Yuma								Pounds
California: Orland	10,000	50,200	5,500	210,800	18,935,000	16,722,200	7,855,000	43,525,000
Colorado:								
Grand Valley		1,268,325						1,268,325
Uncompahgre	7,033,665	499,450	19,900	3,620		67,100		7,683,735
Idaho:								
Boise								
King Hill	3,687,045	464,560	20,250	2,244,725		205,400		6,621,980
Mindoka, Gravity division	1,198,950	1,030	1,000			3,850		202,530
Montana: Milk River	58,130					23,000		81,130
New Mexico: Carlsbad	20,000							20,000
New Mexico-Texas: Rio Grande	4,880	282,950	1,695,400			324,150		2,305,440
Utah: Strawberry Valley	605,160	3,634,800	23,000	600		70,770		4,294,410
Washington:								
Okanogan	25,000,000	19,600	221,810	2,000		32,520		25,275,930
Yakima								
Sunnyside division	39,898,900	2,590,135	8,197,250	1,794,925		3,745,530		53,023,810
Tieton division	81,672,130	1,715,400	8,760,000			1,114,000		93,251,530
Wyoming: Shoshone, Garland division	35,700					2,270		38,080
Total	158,080,700	10,454,540	13,925,150	4,246,670	19,277,000	22,474,940	8,714,150	242,173,150



## Summary of crop reports on Government reclamation projects in 1924—Total yields—Continued

State and project	Vegetables and truck					Miscellaneous			
	Beans	Onions	Potatoes, white	Potatoes, sweet	Total	Beets, sugar	Cotton	Cotton-seed	Cane
	<i>Bushels</i>	<i>Bushels</i>	<i>Bushels</i>	<i>Bushels</i>	<i>Bushels</i>	<i>Tons</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Tons</i>
Arizona: Salt River.....	2,592	685	20,167		23,444		43,002,000	56,004,000	
Arizona-California: Yuma.....							11,660,860	22,730,000	
California: Orland.....									
Colorado: Grand Valley.....	10,594	300	98,230		109,124	21,682			
Colorado: Uncompangre.....	12,967	518,226	1,214,890		1,745,573	43,210			
Idaho: Boise.....	1,294	29,963	754,373	350	785,980				3
Idaho: King Hill.....	30	150	24,340		25,020				
Idaho: Minidoka—									
Idaho: Gravity division.....	14,706	171	467,379		482,346	20,405			
Idaho: Pumping division.....	2,770	960	710,570		714,300	21,510			
Montana: Huntley.....	4,940	180	1,610		6,730	58,860			6
Montana: Milk River—	1,814		6,616		8,430	1,500			
Montana: Sun River—									
Montana: Fort Shaw division.....	248		14,852		15,100	360			
Montana: Greenfields and Big Coulee division.....	185		2,475		2,660				
Montana-North Dakota: Lower Yellowstone.....	1,420		11,650		13,070	63,970			
Nebraska-Wyoming: North Platte—									
Nebraska: Interstate division.....	1,040		860,390		861,430	172,710			507
Nebraska: Fort Laramie division.....			146,970		146,970	72,940			
Nebraska: Northport division.....			4,100		4,100	10,280			
Nevada: Newlands.....		700	22,630		23,330				
New Mexico: Carlsbad.....				150	150				
New Mexico-Texas: Rio Grande.....	2,030	4,180		34,880	42,990		7,146,000	12,827,350	778
North Dakota: Williston.....		575	4,000		4,575	3,910	25,807,580	50,463,340	6
Oregon: Umatilla.....			6,290		6,290				
Oregon-California: Klamath—									
Oregon: Main division.....			45,500		45,500				
Oregon: Tule Lake division.....			1,000		1,000				
South Dakota: Belle Fourche.....			4,940		4,940	9,860			
Utah: Strawberry Valley.....	130	3,622	42,498		46,250	53,560			
Washington: Okanogan.....			3,060		3,060				
Washington: Yakima—									
Washington: Sunnyside division.....	4,390		1,929,460		1,933,850	344			
Washington: Tieton division.....	4,130	15,000	106,200		125,330				

Summary of crop reports on Government reclamation projects in 1924.—Total crop values:

Wyoming:						
Shoshone—						
Garland division	11,405	156,155	107,500	28,410		
Frankie division	380	13,025	13,405	3,160		
Total	78,055	575,712	35,380	581,672	87,616,970	1,800

State and project	Cereals						Other grain and seed					
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax- seed	Millet	Total
Arizona: Salt River.....	\$301,179				\$228,583	\$529,762						
Arizona-California: Yuma.....	1,750	\$1,940	\$800		10,679	15,169	\$951,377		\$70,393			\$931,770
California: Orland.....	4,025		50		1,330	5,405			4,450			4,450
Colorado:												
Grand Valley.....		14,465	7,811		20,318	42,594	4,010					4,010
Uncompahgre.....	1,084	37,610	59,117	\$540	192,103	290,454	10,837	\$2,016				13,753
Idaho:												
Boise.....	153,452	109,929	53,006	452	493,081	870,520*	16,460	110,089	15	\$88	\$88	129,740
King Hill.....	2,245	9,253	1,020		4,900	17,403	43,802	1,900				45,402
Mindoka.....												
Gravity division.....	52,335	54,738	21,508	307	167,059	295,927	3,240	12,546				15,886
Pumping division.....	41,669	5,303	14,019		138,017	198,428	792	46,675				47,467
Montana:												
Huntley.....	5,791	19,207	16,977	209	72,265	114,440	551	3,815			24	4,390
Milk River.....	240	3,268	7,513		21,563	32,604	921			1,412		2,333
Sun River.....												
Fort Shaw division.....	2,994	1,030	4,511	250	12,637	20,632		459				459
Greenhalls and Big Conlee divisions.....	3,063	50	17,140		197,110	219,111		4,325		319		4,844
Montana-North Dakota: Lower Yellowstone.....		5,309	6,113	62	3,038	17,587		270		1,322		1,592
Nebraska-Wyoming:												
North Platte—												
Interstate division.....	123,144	211,853	61,148	1,002	30,951	428,698		8,508			1,376	9,974
Fort Laramie division.....	32,816	102,126	96,918		87,773	319,633						
Northport division.....	6,988	48,887	15,626	865	10,643	82,609						
Nevada: Newlands.....	11,700	7,890	2,906		167,804	190,300						
New Mexico: Carlsbad.....							76,459					76,459
New Mexico-Texas: Rio Grande.....	2,655	114,959	2,338	12	18,262	138,226						2,028
North Dakota: Williston.....	120	50	1,215		1,997	2,028					638	84
Oregon: Umatilla.....	110	7,802	88		1,557	9,557						

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1923, to September, 1924.

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State and project	Cereals					Other grain and seed							
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax seed	Millet	Total	
Oregon-California:													
Klamath—													
Main division.....	\$8,304		\$10,500	\$3,046	\$37,410	\$59,260							
Trule Lake division.....			1,360		855	2,215							
South Dakota: Belle Fourche.....	8,301	\$177,849	42,806		14,655	193,610	\$6,916	\$753		\$788		\$8,487	
Utah: Strawberry Valley.....	24,435	4,010	48,692		277,373	354,510	1,170					1,170	
Washington:													
Okanogan—													
Yakima—		610				610							
Sunnyside division.....	8,710	221,876	25,607		96,505	352,698							
Tieton division.....	10,162	36,145	6,899		33,880	86,086		4,147				4,147	
Wyoming:													
Shoshone—													
Garland division.....	14,209	1,848	33,056		44,946	94,059		5,720			\$92	5,782	
Frammie division.....	546	1,428	6,617		4,789	13,380	1,740	5,164				6,904	
Total.....	825,070	1,209,450	864,757	7,345	2,393,871	5,000,493	730,387	207,007	\$74,886	4,567	1,550	1,018,369	
State and project	Hay and forage					Vegetables and truck							
	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage	Pasture	Total	Beans	Onions	Potatoes, white	Potatoes, sweet	Truck	Total
Arizona: Salt River.....	\$4,825,930		\$170,616		\$594,320	\$698,646	\$5,229,414	\$13,995	\$7,034	\$36,300		\$3,035,850	\$3,038,179
Arizona-California: Yuma.....	640,840		75,161		897	22,873	739,570		5,615			100,267	105,882
California: Orland.....	132,052		4,240		648	6,260	144,260			900		100	1,000
Colorado:													
Grand Valley.....	172,470		595	21,740	6,320	2,430	203,555	31,482	450	84,024		19,008	134,894
Uncompahgre.....	445,686	\$1,025	2,642	2,675	1,453	21,556	475,076	52,081	308,424	384,367		21,514	660,566
Idaho:													
Boise.....	984,245	60,157	7,692	17,014	13,827	120,194	1,293,039	2,618	21,614	297,835	\$1,000	24,021	343,138
King Hill.....	131,495	410	150	339		5,553	137,986	119	300	14,544		3,498	18,401
Mindoka.....													
Gravity division.....	634,388	29,118	448			38,543	705,429	35,510	171	233,690		25,292	294,663
Pumping division.....	265,680	7,488				24,360	407,868	6,645	900	855,294		17,933	380,522







## Irrigation and crop results, Government reclamation projects, 1924

State and project	Lands on projects covered by crop census <sup>1</sup>				Other lands served by Government works, usually a partial water supply through private canals under Warren Act contracts					
	Irrigable acreage <sup>1</sup>	Irrigated acreage	Cropped acreage <sup>1</sup>	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Average per acre
Arizona: Salt River <sup>2</sup>	236,000	233,500	215,430	\$22,091,850	\$102.55	79,600	3,800	1,790	\$154,440	\$86.28
Arizona-California: Yuma	70,500	53,180	53,120	4,504,090	84.80	4,150	1,830			
California: Orland	20,660	11,970	9,970	224,950	22.57					
Colorado:										
Grand Valley	30,000	13,460	12,600	587,430	46.60	16,750	11,790	11,000	1,500,000	136.40
Uncompahgre	95,200	62,180	62,100	1,941,000	31.26	1,310	1,170	1,170	46,800	40.00
Idaho:										
Boise <sup>1</sup>	144,200	113,630	111,050	2,708,740	24.40	139,380	125,900	119,560	2,736,900	22.89
King Hill	16,890	6,240	6,070	224,630	37.04					
Minidoka						650,000	515,000	485,000	21,600,000	44.00
Gravity division	72,610	55,800	50,340	1,446,280	28.73					
Pumping division	48,960	43,400	40,720	1,186,910	29.15					
Montana:										
Huntley	32,540	19,000	19,770	827,520	41.86					
Milk River <sup>1</sup>	64,800	14,000	14,530	177,360	12.21	41,100	25,900	25,900	355,500	13.70
Sun River										
Fort Shaw division	57,160	7,890	8,140	111,460	13.69					
Greenfields and Big Conlee division <sup>1</sup>		13,740	22,450	290,230	12.93					
Montana-North Dakota: Lower Yellowstone <sup>1</sup>	58,000	14,030	14,030	548,400	39.10					
Nebraska-Wyoming:										
North Platte	202,980	85,850	80,910	2,343,110	28.96	127,115	106,840	106,840	3,577,810	33.50
Interstate division		39,060	39,060	991,720	25.38					
Fort Laramie division		9,170	9,170	176,820	19.28					
Northport division		44,280	40,760	1,405,120	34.47					
Nevada: Newlands	72,625	26,045	23,070	2,239,900	97.10					
New Mexico: Carlsbad	26,045	116,000	103,120	9,624,570	89.34					
New Mexico-Texas: Rio Grande	142,000	1,180	1,180	60,450	51.22	16,000	9,200	8,960	1,040,780	117.23
North Dakota: Williston	7,660	13,130	12,510	604,800	26.76					
Oregon: Umatilla	24,470									





## Summary of crop reports on reclamation projects in 1924

NOTE.—These figures are limited to irrigated crops covered by crop census on Government projects proper, excluding for the most part dry-farm crops, and all crops in most areas served stored water under the Warren Act.

Crop	Acreage cropped		Yields			Crop value		
	Total	Per cent of cropped	Unit	Total	Average per acre	Average per acre	Total	Per cent of total value of all crops
<b>Cereals:</b>								
Barley.....	35,871	3.0	Bushels...	1,165,500	32.0	\$23.00	\$825,070	1.2
Corn (Indian).....	66,410	5.5	do.....	1,297,331	19.0	18.21	1,209,450	1.8
Oats.....	35,571	2.9	do.....	1,051,548	29.0	16.82	564,757	.9
Rye.....	661		do.....	7,829	12.0	11.11	7,345	
Wheat.....	86,861	7.1	do.....	1,857,167	21.0	27.55	2,393,871	3.6
<b>Total.....</b>	<b>225,374</b>	<b>18.5</b>		<b>5,379,375</b>	<b>24.0</b>	<b>22.20</b>	<b>5,000,493</b>	<b>7.5</b>
<b>Other grain and seed:</b>								
Alfalfa seed.....	16,859	1.4	Bushels...	77,044	4.5	43.32	730,387	1.1
Clover seed.....	7,406	.6	do.....	21,131	2.9	28.00	207,007	.3
Grain sorghum.....	1,579	.1	do.....	45,160	29.0	47.41	74,858	.1
Flaxseed.....	298		do.....	1,956	6.5	15.32	4,567	
Millet seed.....	129		do.....	849	6.6	12.01	1,550	
<b>Total.....</b>	<b>20,271</b>	<b>2.1</b>		<b>146,140</b>	<b>5.5</b>	<b>39.00</b>	<b>1,018,369</b>	<b>1.5</b>
<b>Hay and forage:</b>								
Alfalfa hay.....	457,957	37.6	Tons.....	1,254,202	2.7	33.21	15,207,721	22.9
Clover hay.....	9,247	.7	do.....	13,223	1.4	12.00	110,963	.2
Other hay.....	33,764	2.8	do.....	43,992	1.3	14.00	458,828	.6
Corn fodder.....	7,292	.6	do.....	22,947	3.1	16.50	120,352	.2
Other forage.....	39,874	3.3	do.....	65,671	1.6	19.05	759,071	1.1
Pasture.....	142,458	11.7				10.13	1,444,148	2.2
<b>Total.....</b>	<b>690,592</b>	<b>56.7</b>		<b>1,400,035</b>		<b>26.21</b>	<b>18,101,083</b>	<b>27.2</b>
<b>Vegetables and truck:</b>								
Beans.....	7,537	.6	Bushels...	78,055	10.0	28.42	214,221	.3
Onions.....	2,762	.2	do.....	575,712	209.0	135.07	373,056	.6
Potatoes, white.....	37,698	3.1	do.....	6,767,485	180.0	90.96	3,428,847	5.1
Potatoes, sweet.....	316		do.....	35,380	112.0	183.50	58,619	.1
Truck.....	22,474	1.9				188.00	4,063,205	6.1
<b>Total.....</b>	<b>70,787</b>	<b>5.8</b>		<b>7,456,632</b>		<b>115.00</b>	<b>8,137,949</b>	<b>12.2</b>
<b>Fruits and nuts:</b>								
Apples.....	24,801	2.0	Pounds...	158,080,700	6,374.0	167.00	4,151,640	6.2
Peaches.....	2,398	.2	do.....	10,454,540	4,360.0	117.00	280,558	.4
Pears.....	4,234	.4	do.....	18,925,150	4,470.0	145.00	614,122	.9
Prunes.....	1,693	.1	do.....	4,246,670	2,523.0	72.00	120,814	.1
Citrus fruit.....	2,641	.2	do.....	19,277,000	7,537.0	339.00	861,170	1.3
Small fruit.....	3,475	.3	do.....	22,474,940	6,470.0	196.00	688,580	1.3
Miscellaneous.....	3,323	.3	do.....	8,714,150	2,622.0	131.00	430,321	.6
<b>Total.....</b>	<b>43,455</b>	<b>3.5</b>		<b>242,173,150</b>	<b>5,704.0</b>	<b>170.00</b>	<b>7,153,205</b>	<b>10.8</b>
<b>Miscellaneous:</b>								
Sugar beets.....	67,123	5.5	Tons.....	581,672	8.0	61.70	4,140,818	6.2
Cotton.....	216,450	17.8	Pounds...	87,616,970	329.0	84.43	22,516,199	33.9
Cottonseed.....				172,044,700	645.0			
Cane.....	259		Tons.....	1,300	5.0	23.60	6,113	
Other crops.....	18,001	1.5				23.02	414,331	.7
<b>Total.....</b>	<b>301,833</b>	<b>24.8</b>				<b>77.00</b>	<b>27,077,461</b>	<b>40.8</b>
Duplication.....	140,702	11.4						
<b>All crops.....</b>	<b>1,218,610</b>	<b>100.0</b>				<b>54.65</b>	<b>66,488,560</b>	<b>100.0</b>

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**U. S. DEPARTMENT OF THE INTERIOR**

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**ANNUAL REPORT OF THE  
COMMISSIONER OF RECLAMATION  
TO THE SECRETARY OF THE INTERIOR  
FOR FISCAL YEAR ENDED JUNE 30, 1926**



DEPARTMENT OF THE INTERIOR  
HUBERT WORK, SECRETARY  
U.S. BUREAU OF RECLAMATION  
ELWOOD MEAD, Commissioner

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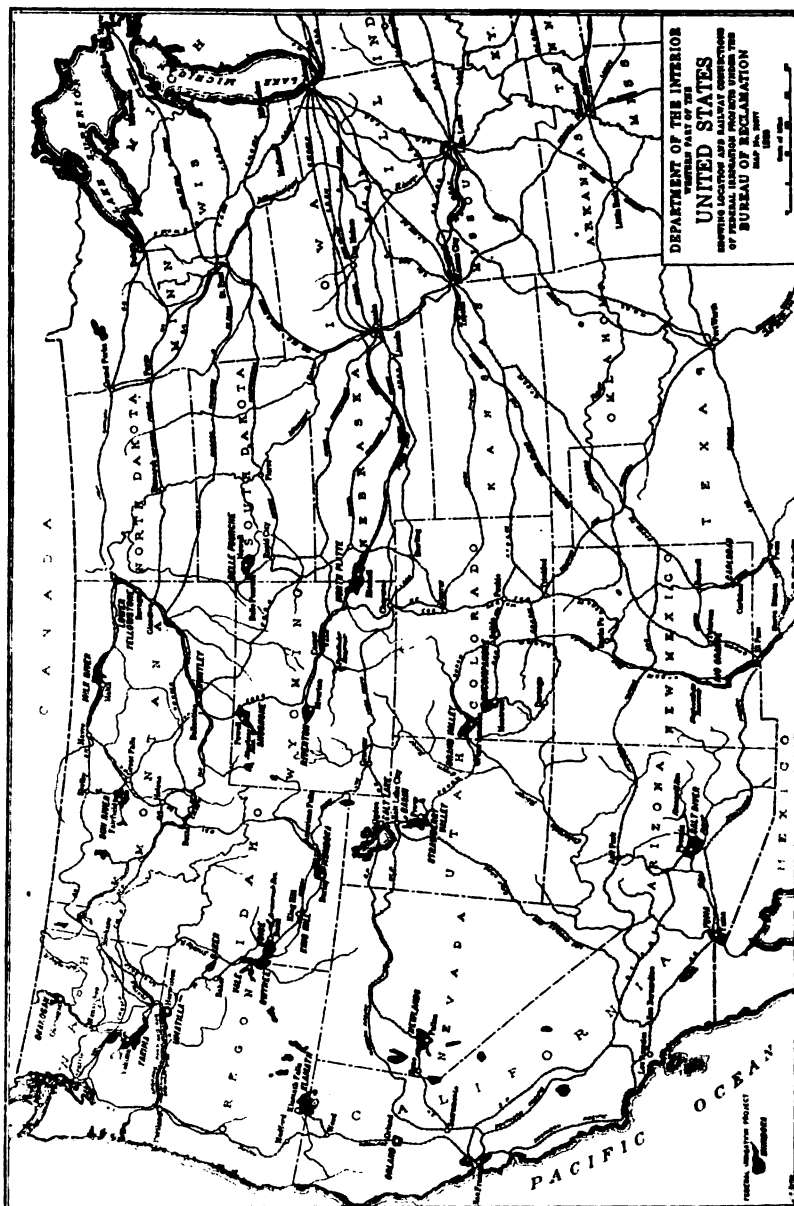
TWENTY-FIFTH ANNUAL REPORT  
OF THE  
BUREAU OF RECLAMATION

Transmitted to Congress in pursuance of the  
Act of June 17, 1902 (32 Stat. 388)

FOR THE  
FISCAL YEAR ENDED JUNE 30, 1926



WASHINGTON  
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1926



12 Bureau of Reclamation  
4-29-32 ✓

## TWENTY-FIFTH ANNUAL REPORT

OF THE

# BUREAU OF RECLAMATION

**T**his report covers the period from July 1, 1925, to June 30, 1926, inclusive.

The total income to the Bureau of Reclamation during this period was \$11,573,157.21.

The total operation expense for the year was \$2,402,316.91.

The total payments received from water users for operation and maintenance were \$1,803,408.59.

Excess of operation and maintenance expense over receipts for the period amounted to \$598,908.32.

The total amount appropriated for construction was \$9,293,133.90.

The total amount expended on construction was \$6,390,667.73.

The total construction payments by water users were \$3,410,281.88.<sup>1</sup>

The total payments from water users in fiscal year 1926 amounted to \$4,454,871.48.<sup>2</sup>

The total payments from water users in fiscal year 1925 amounted to \$3,811,620.19.<sup>3</sup>

Increase, \$643,251.29:

The total area on the projects proper provided with water for irrigation was 1,802,970 acres.

The total area irrigated was 1,320,300 acres.

The total area cropped was 1,242,750 acres.

The value of the irrigated agricultural products on the projects proper in 1924 was \$66,488,560.

The value of the irrigated agricultural products on the projects proper in 1925 was \$77,608,880.

In addition a complete or partial water supply was furnished to 1,340,000 acres of land under Warren Act contracts.

Of this, 1,019,170 acres were irrigated in 1925.

The cropped area was 951,250, producing crops having a gross value of \$53,655,850.

The total value of crops grown in 1925, therefore, on irrigated land furnished with water in whole or in part from the works of the Bureau of Reclamation was more than \$131,000,000.

Increase \$21,000,000 over 1924.

### CONSTRUCTION AND OPERATION RECORD FOR 1925

The bureau operated 100 storage and diversion dams, having a combined volume of 19,221,000 cubic yards. It operated 16,000 miles of canals, waste-water ditches, and drains, of which 243 miles were constructed during the fiscal year.

<sup>1</sup> Includes American Falls Reservoir, \$758,818.99.

<sup>2</sup> Excluding American Falls Reservoir, \$758,818.99.

<sup>3</sup> Excluding American Falls Reservoir, \$2,063,749.73.



Two thousand seven hundred and eighteen canal structures were built, bringing the total constructed at the end of the year to 143,881. The bureau constructed 341 bridges, 446 culverts, 71,000 linear feet of pipe, and 82 flumes.

Earth and rock excavation during the year amounted to 5,801,885 cubic yards, making a total to the end of the fiscal year of 251,616,466 cubic yards.

The Gerber Dam on the Klamath project, Oregon-California, was completed.

McKay Dam for the irrigation of the greater Umatilla project, Oregon, will be completed before the end of the year.

Construction work was continued on the Guernsey Dam on the North Platte project, Nebraska-Wyoming, and on the American Falls Dam, Idaho.

Construction was begun on the Kittitas division of the Yakima project, Washington.

### ADJUSTMENTS AND NEW DEVELOPMENT

The adjustment act was approved on May 25, 1926, providing for exclusion from project obligations of all unfit land, and suspending or wiping out charges on land temporarily or permanently unsuited to the production of paying crops.

Contracts under the act of December 5, 1924, were entered into with a number of projects, providing a new repayment basis and for the operation and maintenance of the projects by the water users.

Provision was made for an intensive settlement and development campaign on the Belle Fourche and Lower Yellowstone projects, under options covering a large enough acreage and at prices that will prove attractive to prospective settlers.

An appropriation of \$15,000 was made for an investigation of how cut-over and swamp land might best be developed, and plans were being made to investigate a number of suggested opportunities in the South for planned rural development.

### ENGINEERING OPERATIONS AND NEEDS

With the exception of the Okanogan and Carlsbad projects, all projects operated in 1925 by the bureau had an ample water supply, the lands without vested rights on the Okanogan project receiving approximately one-third and Carlsbad lands about two-thirds of a full supply. On many projects rainfall during the irrigation season was unusually heavy with marked reduction in irrigation requirements. Material damage was done in some cases to distribution works by storms. The most serious damage occurred on the Rio Grande project from two heavy floods originating below the Elephant Butte Reservoir causing a maximum discharge in the Rio Grande about three times the previous greatest flow experienced since this reservoir was constructed in 1915. Large areas of crops were flooded and many adobe houses destroyed, but damage to irrigation works was not extensive.

On all projects except the Salt River, Yuma, Orland, and Strawberry Valley, extensive work was done in connection with the report of the boards of survey and adjustments, whose recommendations

were enacted into law by the so-called adjustment act approved May 25, 1926. All productive irrigable lands were classified into four classes of varying quality, in addition to the temporarily nonproductive and permanently nonproductive lands which were segregated in classes 5 and 6, respectively.

The following definitions of these six classes of land show clearly why the first four classes should pay construction and operation and maintenance charges, and why class 5 is temporarily suspended from payment and class 6 permanently:

*Class 1.*—Lands that with sufficient water and under approved systems of tillage produce the best crops on the project and that have such even topography that they may be easily irrigated with a minimum of leveling and labor under the approved system of irrigation practice for the project. These are the best lands on the project; of good soil and good topography.

*Class 2.*—Lands of the same productive power as those in class 1, but with a topography so uneven as to require more expense and more labor in the tillage and irrigation of the fields. Such lands, because of their topographic difficulties, are generally less capable of sustaining a completely diversified kind of agriculture. These are usually good lands of poor topography.

*Class 3.*—Lands of lower fertility or productive power, even with ample water and under good systems of husbandry, than those of the above classes. These lands may have an even topography, therefore easily irrigated, but are incapable of producing the yields of the lands under classes 1 and 2. The cause of this infertility may be inherent in the soil or may be due to alkali, gumbo, blow sand, shale, shallow or porous soil, or other factors characteristic of the project. These are poor lands, often of good topography.

*Class 4.*—Lands of poorer productivity than those of class 3 or of the same grade as class 3, but with such unfavorable topography as to increase the expense of cultivation and irrigation and to decrease the crop yield. These are poor lands of poor topography, often with excessive slopes.

*Class 5.*—Lands that are not at present susceptible of agricultural use, but which may gradually by tillage and under changing conditions be made sufficiently productive to justify cropping. Alkali and water-logged lands that may be improved by drainage; excessively heavy soils that may be improved by the incorporation of organic matter or indirect fertilizers; light, sandy soils that may be firming by plant roots; steep soils that may be leveled, and other such soils should be included in this class.

*Class 6.*—Lands that appear to be permanently nonagricultural under the practices of irrigation farming.

#### SALT RIVER PROJECT, ARIZONA

The Salt River project was operated by the Salt River Valley Water Users' Association and has continued its program of additional storage and power development. Mormon Flat Reservoir has been completed and placed in operation. Construction has been started on the Horse Mesa Dam, which will be used largely for power purposes. A large number of wells were drilled and equipped with pumps to raise ground water from beneath the irrigated area to supplement the water supply diverted from the river.

**YUMA PROJECT, ARIZONA-CALIFORNIA**

On the Yuma project the construction of flood protection works for Picacho and Unnamed Washes on the Main Canal was practically completed during the fiscal year. Advertisements were issued and contract was awarded for the construction of the Siphon Drop Power Plant. The plant will be in operation about August 1, 1926, and will furnish 1,500 electrical horsepower.

Bids were opened on March 18 for the purchase of surplus power from the power plant, the specifications requiring the successful bidder to enter into a contract for a term of 10 years. The contract was awarded to the Southern Sierras Power Co. under their bid of 1 cent per kilowatt-hour for all energy furnished between the hours of 8 a. m. and 8 p. m., and three quarters of a cent per kilowatt-hour for the remainder of the day, with a minimum monthly payment at the above rates on the basis of the entire amount of energy available at the plant.

The completion of the drainage system on the Yuma Valley division has been provided for, but additional drainage may be needed on the reservation division. A workable plan is needed for the control of silt and water grass, which now makes the operation and maintenance of the distribution system difficult and expensive. Experiments with concrete lateral lining have proved that this will solve the problem, but further improvements of this kind are awaiting the necessary funds.

The cost of maintaining the levees of the Colorado River, to confine it to its course and prevent flooding of adjacent lands, has been a serious financial burden on the water users of this project, amounting to about \$100,000 a year. Legislation was enacted to relieve them of part of this cost and an appropriation of \$35,000 from the General Treasury has been made for the Government's share of this work for the fiscal year 1927.

The Mesa division of the project embraces about 45,000 acres of sandy land south and southeast of Yuma, Ariz. Lands in Unit B, comprising about 6,300 acres, were designated for sale on December 10, 1919, at a minimum price of \$25 per acre and an additional cost of \$200 per acre for construction charges. The distribution system has been completed for 3,800 acres. Only 675 acres are under development and 1,080 acres still remain unsold.

The construction of a hydroelectric power plant on the Yuma project will soon furnish power for pumping purposes at about 35 per cent of the present cost. During the first five months of 1926, nearly 5 miles of the open earth section laterals were concrete lined, and this work should be continued as additional lands are put in cultivation.

**ORLAND PROJECT, CALIFORNIA**

On the Orland project a small amount of concrete lining was placed on the distribution system. The project experienced in a considerable degree the effects of the severe water supply shortage of the preceding year in less than normal yields of both orchard and field crops, emphasizing the need for the early construction of the proposed Stony Gorge reservoir to provide supplemental storage facilities. Supplemental agreements for the proposed work were

decisively voted by the project landowners and Congress appropriated \$600,000 for beginning construction, which will be contracted early in the fiscal year 1927. Most of the right of way for the reservoir was purchased and arrangements were perfected for removal of highways therefrom. Adjudication proceedings on Stony Creek water rights were continued.

#### **GRAND VALLEY PROJECT, COLORADO**

Operation of the Grand Valley project was continued on a water-rental basis, as public notice has not yet been issued. Additional drains and lateral extensions were constructed on the gravity division. Construction costs should be fixed for this division without reference to the completion of the pumping division or other extensions which may be undertaken in the future. On the Orchard Mesa division the principal activity comprised replacements and improvement of the distribution system. A small amount of work of minor importance on this division remains to be completed during the fiscal year 1927, before the construction charge can be announced.

#### **UNCOMPAHGRE PROJECT, COLORADO**

The irrigation system of the Uncompahgre project is practically complete and only minor lateral extensions were constructed. Two new gate tenders' houses were erected at River Portal. Construction of a comprehensive drainage system is essential to the continued prosperity of the project. The full extent of the lands affected by seepage and the estimated cost of draining them has not been determined because individuals have elected to carry out their own drainage work, and until recently the water users have shown little interest in a comprehensive drainage plan. Additional appropriations will be needed from time to time to permit the cash purchase of vested rights in the Loutsenhizer and Ironstone canal systems as provided under the respective contracts.

#### **BOISE PROJECT, IDAHO**

On the Boise project main canal improvement and drainage construction were continued. Operation of the Arrowrock division has been assumed by the Nampa-Meridian, Boise-Kuna, and Wilder irrigation districts, the United States reserving only Arrowrock Reservoir and the diversion dam and power plant, with one-half mile of the main canal.

Additional drains are needed to keep pace with seepage conditions, and \$200,000 has been provided for this purpose.

Work required on proposed extensions of the project includes a pumping plant and distribution system for the Hillcrest division, which covers 14,000 acres, for which storage capacity has been reserved in Arrowrock Reservoir. However, owing to the shortage of water on the project during two of the past three years, protest was made by various individuals and organizations against the construction of this division until additional studies shall have been made to determine the sufficiency of the water supply.

At Black Canyon diversion dam on Payette River the power plant is complete and furnishing power to the Gem irrigation dis-

trict for pumping, and the diversion dam and pumping plant are delivering water to the Emmett district canals.

To complete the Payette division, the area of which is about 40,000, acres, a canal system and storage on the Payette River are necessary. Before construction can be commenced, however, it is necessary to make economic studies, including soil classification and an estimate of costs for storage and distribution systems.

#### **KING HILL PROJECT, IDAHO**

King Hill was originally a Carey Act project for which the Bureau of Reclamation financed and rebuilt certain works and operated the system under contract. This contract terminated December 31, 1925. The project was taken over by the water users and on March 2, 1926, a contract was entered into providing for the operation and maintenance of the project by the King Hill irrigation district.

#### **MINIDOKA PROJECT, IDAHO**

The bureau operated the distribution system of the south side pumping division of the Minidoka project under public notice until April 1, 1926, when it was turned over to the Burley irrigation district, excepting the pumps which will be transferred next season. The gravity division was operated by the Minidoka irrigation district as formerly.

Power demand for commercial and pumping purposes increased materially, the additional load being handled by operation of the old plants acquired at American Falls. More electric power is needed for irrigation pumping, for replacement of the supply from worn-out plants at American Falls, and for stand-by service at the Minidoka power house. A new unit, to be built during fiscal year 1927, at an estimated cost of \$230,000, will partially meet this demand. A program of drainage construction for the relief of water-logged areas on the pumping division should be undertaken.

#### **HUNTLEY PROJECT, MONTANA**

The Huntley project is completed, except for a small amount of drainage work, estimated to cost \$60,000 which is needed to complete the drainage system and protect all project lands. Some betterment work is gradually being done and paid for as a part of the operation and maintenance expenses.

#### **MILK RIVER PROJECT, MONTANA**

The Milk River project was operated on a rental basis. Construction work was practically completed on the second barrels of the St. Mary River and Hall's Coulee siphons on the St. Mary diversion canal. Before complete irrigation can be accomplished some minor extensions to the lateral system will be required. Additional pipe lines have been provided on the St. Mary diversion canal, but to utilize their full capacity the canal banks at several points must be strengthened and raised. On account of the great distance between the storage works and the irrigable lands, a small regulating reservoir is needed adjacent to the project for the control and conservation of the present water supply.

**SUN RIVER PROJECT, MONTANA**

The canal and lateral systems for lands in the Fort Shaw division have been completed, but drainage is urgently needed. This division has an ample water supply which is obtained from the natural flow of Sun River, supplemented by storage in Willow Creek Reservoir.

Irrigation works and partial drainage have been provided for about 42,000 out of 93,000 acres in the Greenfields irrigation district which comprises all of the land on the north side of the river. Storage for this division is required to supplement the normal flow of Sun River which is exhausted generally by July 15. It is proposed to begin during the fiscal year 1927 construction of Gibson Dam and reservoir, for which an initial appropriation of \$500,000 is available. Soil surveys and land classifications were completed during the fiscal year.

**LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA**

The Lower Yellowstone project was operated and maintained by the bureau under contracts with the two irrigation districts. Work was continued on the program of silt removal from the main canal. Drainage is needed badly and a recent survey shows that \$600,000 will have to be spent to drain all lands now water-logged or threatened with seepage. It is proposed to begin drainage construction as soon as the pending new contracts with the two irrigation districts are executed.

**NORTH PLATTE PROJECT, NEBRASKA-WYOMING**

On the North Platte project work was continued on the replacement of structures on the Interstate division and on the construction of the Guernsey Dam. The demand for power will probably call for the installation of a second unit in this plant in the future. Power income from the Lingle plant increased materially over that of the previous year.

The Pathfinder irrigation district was organized, comprising the land on the Interstate division in Nebraska. Negotiations were under way for turning over the operation and maintenance of the irrigation system to the water users of the three project divisions not later than January 1, 1927.

**NEWLANDS PROJECT, NEVADA**

The water supply for the Newlands project is obtained from the Truckee and Carson Rivers. The Lahontan Reservoir, on the Carson River, stores water from that stream and also flood waters from the Truckee River, carried through the Truckee Canal, for irrigation of lands in the Carson Valley near Fallon. Lake Tahoe, at the head of the Truckee River, was originally contemplated as a reservoir to serve project lands, but its complete utilization for storage during the nonirrigation season has been seriously interfered with by riparian, vested, and power rights, resulting in litigation, which has retarded project development. Regulation of the Truckee River under a temporary restraining order entered in the United

States District Court was initiated during the year and steps were taken to adjudicate the water rights of the Carson River. The commencement of necessary additional drainage work was delayed by litigation. Investigations in connection with the proposed Spanish Springs division were continued to determine irrigable areas and costs of providing a dependable water supply from the Spanish Springs Reservoir.

#### **CARLSBAD PROJECT, NEW MEXICO**

About 2,000 linear feet of concrete lining were placed in the main canal of the Carlsbad project. Operation of the principal works was carried on without mishap. Several hearings were held in connection with the adjudication of the water rights on the Pecos River. Contract has been made between the United States, the Pecos Water Users' Association, and the Fort Sumner irrigation district, providing for further expert study of the water supply and the best location for additional storage for the project.

#### **RIO GRANDE PROJECT, NEW MEXICO-TEXAS**

Construction of the drainage and distribution systems in the Rincon division of the Rio Grande project was practically completed. In other divisions of the project many additional structures were installed in the drainage and distribution systems and the construction of spur and intercepting drains was in progress. Near the outlets of the main drains auxiliary drainage will have to be provided to drain areas of considerable extent. This can be accomplished by deepening the drains at the outlet and pumping the discharge into the river, by carrying the drains through culvert structures under the river to outlets farther down, or by the installation of drainage wells.

The greatest project need, especially in the lower divisions, is river improvement and flood control, neither of which has been contemplated or provided for as part of the project work, but which it is considered should be accomplished cooperatively by the various agencies concerned. Steps have already been taken to consolidate diversions in the lower division of the project, in order to control diversions to Mexico in accordance with treaty provisions. The districts were actively engaged in perfecting plans for power development at Elephant Butte Dam.

#### **WILLISTON PROJECT, NORTH DAKOTA**

By contract dated January 15, 1926, the Williston project in North Dakota was sold to W. S. Davidson. The sale price of \$50,000, payable to the United States in 20 annual installments, includes the electric power system and the irrigation works. In addition the contract provides for the lease of the coal mine for a period of 10 years, during which period a royalty of 10 cents per ton of 2,000 pounds will be paid for all coal mined by the contractor.

#### **UMATILLA PROJECT, OREGON**

The Umatilla project was operated by the bureau under public notice until June 30, 1926, when the project was taken over by the water users of the two districts. Construction of the irrigation and

drainage systems has been completed with the exception of certain betterments provided for in the contracts with the districts. McKay Dam will be completed late in 1926, and storage water from the reservoir will be available for the irrigation season of 1927.

#### **KLAMATH PROJECT, OREGON-CALIFORNIA**

The Klamath project was operated under public notice. Main and Tule Lake divisions are operated directly by the United States. Langell Valley, Horsefly irrigation district, and various pumping districts operate their own systems as does also the Klamath drainage district, but receive their water supply from reservoirs operated for or by the United States. Enlargement of the D Canal to provide additional capacity for the pumping units was in progress during the nonirrigation season. Storage works and a distribution system have been built for 13,000 acres in Langell Valley, and a drainage system is now in process of construction. Of the area unwatered in the bed of Tule Lake the distribution and drainage system for 15,000 acres or more remains to be built. Plans are being formulated for opening additional lands in this division and fixing the construction charge.

#### **BELLE FOURCHE PROJECT, SOUTH DAKOTA**

Activities on the Belle Fourche project were confined to operation and maintenance. The Willow Creek unit of 6,895 acres is the only uncompleted portion of the project. Canals covering this unit have been excavated, but installation of structures has been suspended pending more favorable economic development under the completed works. About \$300,000 will be needed for this feature. Investigation in 1924 of seepage conditions on the project disclosed that about 10,000 acres are affected and that to provide relief and to insure the continued productivity of other areas, a complete drainage system estimated to cost \$1,000,000 is necessary. A contract with the district is under consideration.

#### **STRAWBERRY VALLEY PROJECT, UTAH**

On the Strawberry Valley project water was delivered in bulk at the head gates of the various canals which were operated by the different companies and irrigation districts. Strawberry reservoir storage was further depleted by reason of light run-off and heavy irrigation demand. The reservoir was only one-third full at the end of the calendar year. Some drainage is needed under the West Field and High Line canal systems to prevent loss threatened by rising ground waters. Arrangements are under way for turning over the entire project to the water users for operation in October, 1926.

#### **OKANOGAN PROJECT, WASHINGTON**

The project has been short of water almost continuously since 1917. Water has been pumped from wells, lakes, the Okanogan River, and from substorage in Salmon Lake Reservoir. Vested water rights have been purchased or rented by water users at a cost to many of \$20 to \$75 per acre per season, in addition to Government charges.



All possible sources from which an adequate supply may be obtained are being investigated. A further expenditure of about \$25,000 is desirable for lining laterals with concrete to reduce seepage losses.

### **YAKIMA PROJECT, WASHINGTON**

The Tieton and Sunnyside divisions of the Yakima project were operated for the distribution of irrigation water. Five storage reservoirs were operated to supplement the low flow of the streams, Tieton Reservoir being used for the first time. On the Kittitas division of the Yakima project soil surveys, classification and appraisal of project lands, and final location of the upper end of the main canal were practically completed. By contracts dated December 19, 1925, the Kittitas reclamation district assumed construction repayment and the State has provided \$300,000 for aid in settlement. Contract has been let for construction of the first 4 miles of the main canal, and preparations are being made for advertising for bids on additional stretches.

### **RIVERTON PROJECT, WYOMING**

On the Riverton project the Pilot Butte Reservoir was completed with a capacity of 30,000 acre-feet. The Pilot Butte power plant was operated throughout the year, with over half the power output sold for commercial purposes.

The irrigation system to supply the first unit of 20,000 acres will be completed during the fiscal year 1927. Plans and estimates for the Pilot Canal system covering an irrigable area of 40,000 acres, at an estimated cost, including drainage, of about \$1,500,000, are being made ready for submission to Congress. When this system is built the completed portion of the project will cover 60,000 acres and be of sufficient size to warrant colonization by efficient methods, to permit economical operation, to attract a branch railroad, and to justify the development of the social and economic conditions that are necessary for the success of the project.

### **SHOSHONE PROJECT, WYOMING**

The Garland division of the Shoshone project was operated under public notice and the Frannie division on a water-rental basis. The Garland division is completed except for drainage, for which an additional expenditure of \$310,000 is required. The irrigation system of the Frannie division is constructed for 20,000 acres, but only 8,000 acres are being irrigated, farms on more than half the project land having been abandoned. Terms on which the settlers on the reduced area are to be furnished water are under consideration. A small amount of drainage work was done on this division and construction for about 12,000 acres on the Willwood division was 95 per cent completed. On the Heart Mountain division a topographic survey and a preliminary canal location have been completed, but a soil survey should be made to accurately determine the irrigable area. Studies should also be made of possible extensions to Chapman Bench and Pole Cat Bench. On the Oregon Basin division topographic and soil surveys are necessary to determine the irrigable area and to permit more accurate estimates of cost.

Income of the power plant from the sale of commercial power has now increased to an amount sufficient in itself to pay operating and depreciation costs. During the past year contracts have been made with the Shoshone Electric Light & Power Co., supplying Cody, for a stand-by service, and with the Midwest Public Service Co. for power to be used in Byron and Lovell.

## ADMINISTRATIVE ECONOMIC ACTIVITIES

The economic activities of the bureau consisted of land classification on existing projects made necessary by the provisions of the act of December 5, 1924; land classification, soil surveys, and economic reports on secondary projects regarding the economic value of water; classification and appraisalment of land and improvements on new projects preparatory to the execution of contracts to control land prices within reasonable limits; assisting the board of survey and adjustments in the collection and assembling of data regarding the agricultural and economic phases of projects; preparing literature describing the opportunities for settlers on projects and disseminating this information to prospective settlers or inquirers; and cooperative activities with water users' organizations and other agencies to obtain settlers and to create needed cooperative organizations.

### LAND CLASSIFICATION

The land classification on existing projects commenced in 1925 was completed during the fiscal year. In all, about 1,200,000 acres of land were classified on 18 projects and the results of such classification made available to the board of survey and adjustments in order to determine the area of productive lands, the temporarily unproductive lands, and the permanently unproductive lands. Land classification and appraisalment were commenced on the Vale and Owyhee projects, Oregon; the Spanish Springs project, Nevada; the Greenfields division of the Sun River project, Montana; the River-ton project, Wyoming; the Kittitas division of the Yakima project, Washington; and the Willwood division of the Shoshone project, Wyoming. Land classification and economic reports were made on the Deschutes and Umatilla Rapids projects, Oregon; and on the Okanogan-Methow project, Washington.

### SETTLEMENT PROGRESS

Progress in settlement of existing projects showed a slight improvement over the previous year. More inquiries were received. The Belle Fourche, Lower Yellowstone, and Milk River projects obtained some tenants, particularly those skilled in beet growing. The Rio Grande project continued to get settlers through the intensive advertising of the Gateway Club and other agencies. Plans have been prepared with the water users' organizations and the railroads serving the Lower Yellowstone and Belle Fourche projects to obtain settlers for the unoccupied land. The first step in this plan was that the irrigation districts at Lower Yellowstone should secure options for a period on at least 8,000 acres of land at prices and upon terms that can be approved by the Secretary of the Interior. The same conditions are to apply to 10,000 acres of land on the

Belle Fourche project. This is to be followed by cooperative efforts on the part of the water users, chambers of commerce, railroads, and the United States to secure settlers of experience and with some capital to purchase these lands.

The first 20 units of the Pavillion division of the Riverton project were thrown open to settlers late in the spring of 1926 and efforts are being made to secure settlers for the privately owned land and the remainder of the public land that can be supplied with water in this division.

Conferences were held with water users' organizations, railroad representatives, chambers of commerce, and bankers to make plans for settling the unoccupied lands on projects. The plans formulated provide for listing lands on their productive value, the selection of settlers with experience and some capital, the preparation of some land before settlement, and cooperative advertising. Distinct progress has been made in awakening a realization of these essentials in a program of land settlement.

One index of the bureau's activities during the year is the number of contracts entered into and the different subjects involved, which are summarized in the following table:

Nature of contracts	Number of contracts	Amount involved
Cooperative investigations	7	\$31, 227.50
Supplies	538	299, 634.08
Material	225	634, 908.18
Equipment	132	337, 348.52
Miscellaneous services	136	104, 843.45
Construction work	60	773, 787.90
Land purchases, including improvements	289	667, 193.55
Land sales, including improvements	329	144, 911.00
Leases to the United States	35	3, 415.14
Leases from the United States	453	200, 639.92
Compromise of damages	13	2, 071.04
Rental of Government equipment	56	17, 549.56
Rental of water	791	307, 353.67
Sale of surplus electrical energy	63	137, 169.34
Sale of water rights under the Warren Act <sup>1</sup>	28	636, 506.48
Sale of water rights within projects	109	303, 776.75
Adjustment and relief	1, 171	185, 437.17
Transfer of project operation	1	2, 650, 000.00
Miscellaneous	66	134, 680.67
Total	4, 512	\$ 7, 543, 316.81

<sup>1</sup> Includes some construction work.

<sup>2</sup> Estimated in part.

## ECONOMIC CONDITIONS

### SALT RIVER PROJECT, ARIZONA

This project is favored with productive soil and a long growing season and is one of the most successful Federal projects. The crop range varies from semitropical plants, such as citrus fruit, to all of the crops common to the Temperate Zone. There are no abandoned or unentered farms, and the land is all in private ownership. There is room for new settlers through the subdivision of large holdings.

**YUMA PROJECT, ARIZONA-CALIFORNIA**

Crops grow on this project for practically the entire year. Those chiefly grown are cotton, alfalfa, melons, grapes, and alfalfa seed. All of these are produced and sold in carload lots. The project continues to have a high percentage of tenants, and there is a real need for subdivision of the large holdings into smaller units, which should be occupied by resident owners. The Yuma Mesa is peculiarly adapted to the production of grapefruit because of its frost-free conditions. Oranges and lemons can also be produced but are not deemed to be as profitable. Vegetables are grown between the young trees in the winter and command high prices.

The principal need is the organization of syndicates or other agencies to prepare land and plant and care for grapefruit groves during the period before bearing is reached. Progress has already been made in this direction. One syndicate of 200 acres is a going development, and another is in process of being organized.

**ORLAND PROJECT, CALIFORNIA**

The outstanding economic need of the project is the construction of works providing for additional storage water and the bringing into production of more than 3,500 acres of land still in an unimproved state and held mostly by nonresident and nonfarming owners.

They have been unable to dispose of the land even at reasonable and fair prices.

Prices for project produce were in general fairly remunerative, largely as the result of local cooperative marketing agencies which are functioning satisfactorily.

Development consisted for the most part of the reseeding of alfalfa stands which had been depleted as a result of the water shortage of 1924. There was an increase of 2,000 acres in the area irrigated over that for the previous year, but very little new land was improved and brought into a producing state. The most gratifying feature of the recovery from the adverse effects of the drought year of 1924 was the increase of 750 dairy cows, a number exceeding by 225 the loss sustained during 1924. Cotton, raised in commercial quantities for the first time on the project, yielded satisfactory returns. The installation and operation of a plant for preserving Kadota figs constituted a new industry of great benefit to the project, both as a means of disposing of this crop profitably and as a source of employment for considerable local labor during the canning season. The plant is financed and operated by the local fig growers' association.

**GRAND VALLEY PROJECT, COLORADO**

The farmers are learning by experience better methods of tillage, crop rotation, and farm management. All would, however, be benefited by competent advice and demonstration from an agriculturalist. This is especially apparent this year when pest control is of vital importance.

Several local organizations are interested in a colonization program and progress has been made in obtaining listings and inquiries. The first efforts have been concentrated on the better lands occu-

pied by tenants or vacant and with reasonable agricultural success it is believed that good results will be obtained.

The greatest improvement is noted on Orchard Mesa, where the area irrigated has more than doubled since the beginning of the reconstruction program. Peach orchards are being planted, new homes built, and good roads provided on a large portion of this district. Mail and telephone service are established, and the population has greatly increased.

#### UNCOMPAHGRE PROJECT, COLORADO

Thus far farming has been confined to the growing of staple farm crops, such as alfalfa, small grains, sugar beets, potatoes, beans, and onions. A small acreage of apples is also in bearing. These crops in some years have had to be marketed at a loss, owing to heavy freight and marketing charges. Extension workers have mapped out a project program for the next five years to promote livestock improvement, cooperative livestock feeding demonstrations, and crop improvement.

For the period 1922 to 1925 the uncollected construction charge on this project amounts to \$230,314. The unpaid operation and maintenance charges amount to \$125,761.47. The situation is, however, encouraging. Good crops and prices ruled in 1925. As a result the uncollected 1924 construction and operation and maintenance charges were paid up in full on all farms using water, and in addition the accumulation of past delinquencies during previous years was reduced about 10 per cent.

The Delta Cannery, which has lain idle in the hands of a receiver for the past two or three years, resumed operations during the spring of 1926, offering an additional outlet for small fruits and vegetables. A sawmill, crate and box factory has been established at Montrose, and it is anticipated that the needs of project farmers will now be supplied locally at less expense. A Montrose County farm council has been organized and is directed by two representatives from each industry. This council is directing its efforts toward better grading and cooperative marketing.

Whatever settlement has taken place has resulted from the spread of the local population to vacant farm units and the subdivision of private land holdings.

#### BOISE PROJECT, IDAHO

Fruit growing and specialized crops, such as head lettuce and potatoes, as well as general farming, are successful on this project. Dairying is one of the most profitable industries and is steadily increasing. More than 90 per cent of the farmers on the land have had experience in irrigation farming.

Distance from large markets and high freight rates require the development of concentrated products. A vegetable cannery was operated at Wilder for the first time during the summer of 1925. The supply of corn was in excess of the capacity of the cannery. The production locally of potato chips is becoming an important industry. There is room for development of more mill products from wheat and corn.

More diversified crops, more refined products, with an improved marketing system, are the major needs of the project. More livestock should be raised and fed on farms. Lower interest rates would benefit settlers immediately and directly.

The formation of two irrigation districts covering project lands and one district covering partial water-right lands has done much to stabilize land values and irrigation obligations. Contracts have been made with these districts under the modified terms of repayment on a basis of 5 per cent of the average gross annual crop returns instead of the 20-year schedule previously in force.

#### **KING HILL PROJECT, IDAHO**

The production of early potatoes is one of the chief industries. Alfalfa is also grown in large quantities. The long distance from large centers and consequent high freight rates require that all forage crops should be fed to livestock and the products sold in concentrated form. More good livestock are needed on this project. More resident farm owners are needed. This can be brought about by the subdivision of large land holdings and the settlement of these areas by skilled cultivators. Land prices should be fixed and the unoccupied areas disposed of under a uniform selling contract in which a small amount is paid down and the balance amortized over not less than 20 years. This would encourage people with small means, but who are industrious and thrifty, to purchase land and become home owners.

#### **MINIDOKA PROJECT, IDAHO**

The outstanding economic development of the year was the contract applying the terms of the fact finders act providing for operation and maintenance of the south side pumping division canal system and funding nearly a million dollars in delinquent charges.

Organization of a cream pool, merging the product of about 1,600 cows, has been effected, under the name of the Mini-Cassia Dairymen's Association, with headquarters at Burley.

Other new cooperatives organized or participated in by project farmers were the Cassia County Beet Growers' Association and the Southern Idaho Turkey Growers' Association.

Economic improvement was shown by an increase in the irrigated farm population from 7,197 in 1924 to 7,227 in 1925, an increment in livestock numbers and values, a total crop value of nearly \$5,000,000 compared with a little more than \$2,630,000 in 1924, liquidation of a large amount of mortgage indebtedness, betterments in buildings, home surroundings and living standards, and in a better morale throughout the business and social life of the community.

#### **HUNTLEY PROJECT, MONTANA**

In general the Huntley project is in good condition. The 1925 crop yields were average or better, with prices, except those for sugar beets, well above the average. Approximately one-fourth of the irrigated area of the project is growing sugar beets, a proportion large enough to provide ample cash returns to finance the farmers' operations.

Perhaps the most notable feature of the agricultural and economic situation on the project during the past 8 or 10 years is the increase in the size of farm holdings. The original plan of the project was 40-acre tracts. The usual condition now is an ownership of 80 to 120 acres.

The Great Northern bean crop has appeared within the past few years. It works in well with any rotation system, is a cash crop, requires less labor to grow and market, and produces good returns.

Winter stock feeding is increasing rapidly and can be increased still further under proper direction and financing.

Tame pastures are aiding in the development of dairying and sheep feeding. An excellent grass mixture has been developed which has a heavy carrying capacity and is being widely used in the Yellowstone Valley.

#### **MILK RIVER PROJECT, MONTANA**

About 43,000 acres of the Malta and Glasgow division are unirrigated, 40,000 acres being dry farmed and producing crops valued at less than \$5 per acre. Of 251 farms under irrigated cultivation on these divisions, 149 are farmed by owners and 102, or 41 per cent, by tenants. Very little intensive farming is practiced, but this is being somewhat stimulated by the good yields obtained recently from cultivated crops.

The slow agricultural development and small payments from settlers have been matters of great concern to the bureau for a number of years. However, with the favorable legislation of the past year the assurance that the project is adapted to the production of other than cereal and forage crops, and the general upward tendency of agricultural conditions, a spirit of optimism prevails and considerable improvement is anticipated.

The project has been operated for 15 years. Water for irrigation has been furnished on a rental basis, with a charge insufficient to pay operating costs, thus causing a continually increasing deficit. Operating expenses from 1921 to 1925, inclusive, amounted to \$486,573, of which only \$92,067 has been repaid by irrigators. The total deficit for the period of operation amounts to \$467,037. At the close of the fiscal year steps were being taken for the negotiation of contracts under the provisions of the act of May 25, 1926, in which this deficit will be funded with construction costs and a definite acre charge fixed.

Ample water is available for present needs. Good yields of alfalfa and alfalfa seed, small grain, and hardy vegetables are obtained under proper farming methods. Although the sugar-beet crop of 1925 was not the financial success hoped for on account of unseasonable weather at the time of harvest, satisfactory yields proved the ability of the lands to produce this crop. Considerable advancement has been made in the production of certified seed potatoes, and a market has been established for this crop at a very satisfactory price.

Settlers with experience and some capital are needed. Large holdings should be subdivided and placed on the market at prices and terms of payment which are attractive, and wherever possible some previous development or improvement of such lands should be undertaken that pioneering may be reduced to the minimum and early profitable returns yielded. Tenants who are good farmers should be encouraged to become landowners. Intensive farming, production

of cash crops, and improved methods of tillage should be encouraged. The Bureau of Reclamation and the railroads should cooperate with the local organizations to every extent possible in these matters, as the development of the project and its financial success depend upon such action.

### SUN RIVER PROJECT, MONTANA

The project is well suited to the industries of livestock growing and dairying. Alfalfa is the principal crop and a change is slowly taking place from extensive wheat farming to more intensive types of farming under irrigation. There has been an increase in the number of sheep and the quality of dairy stock has improved. A good start in sugar-beet culture was made in 1925, but adverse weather conditions which prevailed during the harvest season have had a discouraging influence and it will take a few years to recover from the setback received at that time. A good showing is being made on well-cultivated lands that have been planted to sugar beets in 1926, and higher prices will be paid as the sugar company has arranged to absorb all freight on beets shipped from the project to Chinook, Mont.

An irrigation district embracing all lands on the north side of Sun River was created under the State law May 28, 1925. Consideration was given during the fall and winter months to a form of contract which provides that the United States will complete the project and the landowners make payment of the construction costs on the basis of 5 per cent of the average gross crop production. A form of contract was approved by the First Assistant Secretary of the Interior, February 16, 1926. The Montana statutes provide that at least 60 per cent of the landowners owning 60 per cent of the land shall sign petitions authorizing the commissioners of the irrigation district to execute the contract. The necessary signatures were secured, and on June 10 the officials of the irrigation district signed the contract and also filed a petition with the clerk of the district court to have the legality of all steps taken in the creation of the district and the execution of the contract confirmed by the court.

On the Fort Shaw division an irrigation district was created in 1919. Contracts have been considered from time to time during recent years but no definite action has yet been taken. The large amount of delinquent payments on this division makes it absolutely necessary that some form of contract be executed so that adequate relief can be granted and the present settlers given a chance to go ahead with their farming operations without having to carry an excessive burden in the way of unpaid water charges. The form of contract thus far considered contemplates that the district will take over the operation and maintenance of the canal system; that delinquent water charges will be funded with future construction charges and that payments will be made under the provisions of the act of December 5, 1924. It is expected that an agreement on the form of contract will be reached early in the fiscal year 1927. During the period 1920-1925 the operation and maintenance assessments on this division amounted to \$82,249.78 and \$52,169.32 have been collected. In the construction account the assessments amount to \$73,391.63, of which \$42,241.96 have been paid.



**LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA**

New houses and barns are being erected. Buildings are being painted and repaired. The period of depression is past and the farmers are beginning to realize some profit from their operations.

Although there was no influx of settlers during the year, numerous inquiries about farms were received. In most cases purchase was delayed pending congressional action on the adjustment of water charges and terms of payment. It is expected that the passage of the adjustment act will result in a decided increase in settlers in the near future. Crop failures on surrounding dry-land farms are causing many to turn to the irrigated land of the valley. Most settlers of this class will have stock and machinery but little or no capital.

**NORTH PLATTE PROJECT, NEBRASKA-WYOMING**

Considerable land on this project is sandy and rolling and not yet fitted for the production of such crops as potatoes and sugar beets, but will produce good crops of either alfalfa or sweet clover when properly handled to obtain a stand. Settlers who are willing to make their home on the land, and have some knowledge of dairying, poultry raising, and stock feeding, would succeed. A market has been established for these products principally through the cooperative associations now functioning on the project. A survey of the project shows that the number of dairy cattle increased during 1925 and the grade of milch cows is steadily improving. One of the best bred herds of Holstein cattle in the State of Nebraska is located in the valley. There are two creameries in the valley besides many receiving stations that ship the butterfat to outside points. About one and one-half million pounds of butterfat are shipped out of the valley annually.

There are now four cooperative cheese factories located in the valley that manufacture an excellent quality of cheese. This is sold through a commission firm in Omaha which handles all the cheese that can be turned out from the factories and would be glad to obtain more.

The South Sioux Poultry Association, another cooperative organization, organized about three years ago is steadily improving the quality and increasing the quantity of their products. During the last year about 16,000 turkeys were raised and sold in the valley. This association is instructing its members as to the best methods of raising and packing both the eggs and the meat, and has developed a marketing system through which the product is sold. The attention of outside buyers has been attracted and representatives are sent into the valley to purchase the poultry products. This has a tendency to increase the price received by the producer and also to improve the quality. Some of the members of the association maintain prize flocks of turkeys and are raising them for breeding purposes only.

Stock feeding has developed into quite an industry. About 100,000 head of sheep and 7,000 head of cattle were shipped in during 1925 to be fattened on the project. This provides a market for the major portion of the hay and grain raised.

Four sugar-beet factories located in the valley provide a market for the beets. The average yield of beets during the past year was 16.4 tons per acre, which is the world's record for such a large acreage.

Potatoes are marketed usually through local buyers and the yield and quality last year were above the average. Marketing conditions on the project are steadily improving. Consequently the products are improving in quality and demand better prices.

On the Northport division there has been no change in settlement conditions for the past two years. On the Interstate division there has been a slight improvement. There were still some transfers of ownership and settlement of obligations, and there were also several sales of land to farmers, mostly to local landowners. On the Fort Laramie division conditions were good. There were several transfers of ownership to new settlers and there was also considerable development in the way of new houses, barns, fences, and other improvements. During the spring a number of inquiries were received from prospective purchasers of land, especially the Gering Valley.

Taking the project as a whole, practically all of the better lands are farmed with fair to excellent results. A more optimistic feeling has developed among the landholders, which has resulted in a better application of farming methods as evidenced by the excellent yields produced on the project during the past season.

#### **NEWLANDS PROJECT, NEVADA**

Since 1924 alfalfa weevil quarantine regulations have prevented shipment of alfalfa hay to outside markets. The consequent rapid development of the dairy industry as the best means of converting hay into cash has placed this industry in a position of first importance. Its full development has been retarded, however, by the difficulty and cost of securing purebred sires for improving dairy herds.

Ninety per cent of the project farms are mortgaged, paying 7 and 8 per cent interest on short-time loans. Long-time credits with low rate of interest would be an important factor in future progress.

There have been numerous transfers and sales of present-entered farm units and private lands, but new settlement has been at a standstill. The total area of land under water-right application has been reduced materially owing to cancellation and adjustment of irrigable area on existing farm units.

#### **CARLSBAD PROJECT, NEW MEXICO**

The two principal crops are cotton and alfalfa.

The tendency on the farms during the fall and spring of 1925-26 has been to increase the acreage devoted to alfalfa. This acreage should be largely increased as soon as possible to permit a proper rotation of crops and to induce better marketing conditions.

Evidence furnished by marketing organizations at near-by points in the southwest indicates that important savings could be made for the farmers by closer cooperation. Many more farmers are needed on the project. The best managed and most productive farms are the relatively small ones, where the farmer lives on the farm.

Very few farms changed ownership during the year. Tenantry has not decreased. Among resident farmers progress is shown by better crop management and improvements.

Bank statements indicate considerable improvement in general financial conditions.

**RIO GRANDE PROJECT, NEW MEXICO-TEXAS**

There has been a marked increase during the last three years in the rate of agricultural settlement and development of the valley lands comprising the Rio Grande project. It is even more gratifying to note the steady healthy growth and permanent character of the farm improvements. The following tabulation clearly illustrates the steady and substantial advancement made in the project's agricultural development.

*Agricultural development of the project*

Year	Number of farms	Acres irrigated	Acres cropped	Value of crops	Value of crops per acre	Population of farms	Miles of irrigation canals operated
1921	3, 204	81, 234	76, 551	\$2, 115, 493	\$27. 64	11, 774	416
1922	3, 534	80, 309	79, 044	3, 794, 940	48. 01	11, 267	416
1923	3, 745	88, 959	86, 985	7, 205, 799	82. 83	15, 925	537
1924	4, 119	113, 185	103, 115	9, 624, 512	93. 34	18, 128	584
1925	4, 442	130, 911	121, 799	10, 676, 614	87. 66	20, 583	607
1926 <sup>1</sup>	4, 911	142, 184					

<sup>1</sup> Advance estimate.

Total area of project when complete, 155,000 acres.

With the cultivated area now approximating 100 per cent of the completed project and with opportunities for still further development through more intensive and diversified farming, agriculture, having been one of El Paso's lesser important fields of industry, has come to be and will remain one of its leading resources.

**UMATILLA PROJECT, OREGON**

Too much alfalfa continued to be shipped off the project. Asparagus and early potatoes have proven profitable. More livestock, chickens, and turkeys and greater diversification of crops are still needed.

The adjustment act eliminated about 4,800 acres of nonproductive lands. Under the terms of new contracts, the irrigation districts have been relieved of the burden of delinquencies, and with a fresh start, the project should show a steady development.

**KLAMATH PROJECT, OREGON-CALIFORNIA**

Satisfactory yields of alfalfa, tame and wild irrigated pastures, and small grains, adjacent forest reserves for summer pastures, plentiful stock water, freedom from livestock diseases, and cheap lumber for barns and stock sheds adapt this project to stock and dairy farming. Sugar beets were grown on an extensive experimental scale for the first time, about 500 acres being planted in 1925. Where properly cared for satisfactory results were obtained. The growing season is short but the days of summer are long and warm causing crops to make a rapid growth.

The Klamath irrigation district has paid all charges to and including those due June 30, 1925. Substantial payments have also been made on installments due subsequent to June 30. The Horsefly irrigation district, Enterprise irrigation district, Klamath drainage dis-

trict, and upper Van Brimmer drainage district have paid all water-right charges due to date. Other districts are not greatly in arrears.

Plans for settlement of 7,000 acres of the Tule Lake division have been deferred owing to a protest by the water users on the settled part concerning the construction charge. However, a recent economic analysis showed that the morale of these settlers had greatly improved and that most of them had made a satisfactory showing. It is proposed to open to settlement 7,000 acres for which construction has been completed.

#### **BELLE FOURCHE PROJECT, SOUTH DAKOTA**

The project has sound agricultural advantages, with an ample water supply, productive soil, and favorable climate. Crop yields in 1925 attracted attention, with sugar beets averaging 16.1 tons, or the highest of any Great Western territory. Cucumber pickles returned as high as \$500 per acre and field corn, small grain, and alfalfa produced profitably.

The project needs more resident farmers. Only 45 per cent of the farms are occupied. The balance have passed to loan companies or are owned by nonresidents whose chief income is from occupations other than farming. Some of the irrigable land is being offered at attractive prices, but sales are negligible, although a few additional tenants were attracted last year. Resettlement must be undertaken in a large way and as a combined movement of all interests. To this end a conference was held on the project on July 16, 1926, in which the railroad, sugar company, loan companies, irrigation district officials, and officials of the Bureau of Reclamation participated. It was agreed that options would be taken on 10,000 acres of land upon terms and prices that could be approved by the Secretary of the Interior and that these lands should be sold under a uniform selling contract. Ten per cent deposit would be paid in cash and the balance amortized over 20 years with interest at 6 per cent. The railroads will join the United States in advertising these opportunities and in assigning their field men in territories where settlers may be secured. Much of the land for sale is planted to alfalfa and is equipped with buildings. This will make it possible to take settlers with less capital than if the land were bare. A man trained in settlement work should be assigned to the project to assist settlers to obtain farms suited to their capital and the labor in the family and also to make sound agricultural and financial programs. It is believed that if this program is vigorously put into effect from 100 to 200 families may be brought into the project within the next two years. More resident owners will lead to industrial development.

#### **STRAWBERRY VALLEY PROJECT, UTAH**

The agriculture of the project is diversified with a wide range of crops and is served with sugar factories, canneries, and other industries. High-priced crops for canning, such as peas, beans, and tomatoes, are being grown more extensively each year. The acreage in fruits and small berries is also increasing.

The project area is generally fertile and well cultivated; 47,772 acres were irrigated out of 53,890 acres for which water was available in 1925.

The record of payments for water is unsatisfactory. During the five-year period 1921 to 1925, of the \$672,522.52 construction charges accrued, 39.91 per cent is unpaid, and of the \$244,753.28 operation and maintenance assessments, \$58,711.56 is delinquent.

Adjustment of project delinquencies and time extensions are now being made by the bureau under subsections L and F of the act of December 5, 1924, and the act of May 25, 1926, contingent upon the taking over of the project by the water users' association under suitable contract. All indications point to the early execution of such a contract between the United States and the association, providing for the complete repayment of all the project construction costs.

Settlement problems do not exist on the project, as all public lands have been taken up.

The only important development during the year was the enlarging of the canning factory of the Utah Packing Corporation at Spanish Fork to provide for a 50 per cent increase in output.

#### **OKANOGAN PROJECT, WASHINGTON**

The principal need of the project is an ample water supply. Practically one-third of the project is not cultivated owing to lack of water. The 1925 crop was below normal owing to the continued water shortage. Three groups of water users were installing plants to pump from the Okanogan River to supplement the water supply on approximately 1,000 acres of project lands.

#### **YAKIMA PROJECT, WASHINGTON**

The Yakima project had a very successful crop year in 1925. On the Sunnyside division the total crop return was \$8,978,767, or 82 per cent above that of the previous year, owing to better prices and a large crop. The return on the Tieton division was \$3,025,301, or \$169,522 less than that of the previous year, owing mainly to a reduction of the cropped area.

Collections have improved. Banks and loan companies report a liquidation of farm mortgages and other indebtedness. Better homes are being built and improvements to irrigation systems are being made.

Practically all lands are taken up and there is no settlement problem. Better returns have caused an increase in farm values and an increase in sales.

The Tieton division is in need of more water. On the Sunnyside division an equalization of operation and maintenance charges to all water users is desirable and necessary in order that improvements and betterments may be paid for by all who are benefited thereby.

#### **RIVERTON PROJECT, WYOMING**

Twenty farm units of public land were opened for settlement by public order dated March 3, 1926. Settlers are being selected on the basis of approved qualifications of industry, experience, character, and capital.

The cost of the water right has not yet been fixed. Temporarily water is being delivered on a rental basis with a minimum payment

in advance of \$1 per acre, entitling the water user to 2 acre-feet of water per acre. Additional water, if needed, may be purchased at 50 cents per acre-foot.

Soil and climatic conditions are adapted to the production of alfalfa, sweet clover, grain, sugar beets, potatoes, vegetables, and seed crops.

The most urgent need is for a branch railway. Until such a railway is constructed it will be necessary to concentrate on livestock and its products. Credit is needed to finance the purchase of livestock.

### SHOSHONE PROJECT, WYOMING

The principal crops of the project have been alfalfa, sugar beets, potatoes, and small grains. In the past few years beans, both Great Northern and seed beans, and seed peas have begun to take an important place as cash crops. A spur railroad to the north area of the Garland division and a sugar factory would permit sugar-beet culture there and the feeding of pulp to stock and sheep. Two-thirds of the 1925 alfalfa hay crop was shipped from the project. This is unprofitable. Stock and sheep feeding would help secure the proper returns from crops and maintain soil fertility.

On the Garland division considerable liquidation of private indebtedness occurred. Collections on account of construction and operation and maintenance were about \$72,000. This is \$78,000 less than the 1925 accruals, but is about three-fourths of the payments necessary to be made if the division operates under the act of December 5, 1924. A contract under that act was being negotiated deferring delinquencies, except the 1924 charges, and providing for taking over operation and maintenance.

The Frannie division was operated on a rental basis. Only one-third of the irrigable area was under cultivation, and collections were about one-third of the operation and maintenance cost. That, in turn, was about one-sixth of the gross crop production. Refunds under the act of February 21, 1925, and cancellations for failure to comply with homestead requirements, extinguished the titles of nearly all the entrymen except those who desired to proceed with the development of their lands. About one-third of the irrigable area of the division is vacant public and undeveloped State and railroad land. Recovery from the deflation was hindered first by abandonments tying up the land and was later arrested by fear that the division would be abandoned. The settlers remaining are anxious to proceed with the development but they are poverty stricken as a result of the deflation and the requirements for capital to develop raw land. Aid will be necessary in decreasing amounts for three or four years to help carry operation and maintenance costs, but at the end of that time they should be able to finance that. Construction repayments, except for the best lands, will need to be further extended, and when they begin will have to be on a basis at least as favorable as the 5 per cent of crop production scheme. Help in the settlement of vacant lands and easy term credits for the development of domestic water supplies and the purchase of improved varieties of stock and sheep would hasten rehabilitation of the division.

In the spring of 1926 about 40 German-Russian families moved to the Garland division to engage in sugar-beet production. Whether these families have come to be landowners eventually or are here

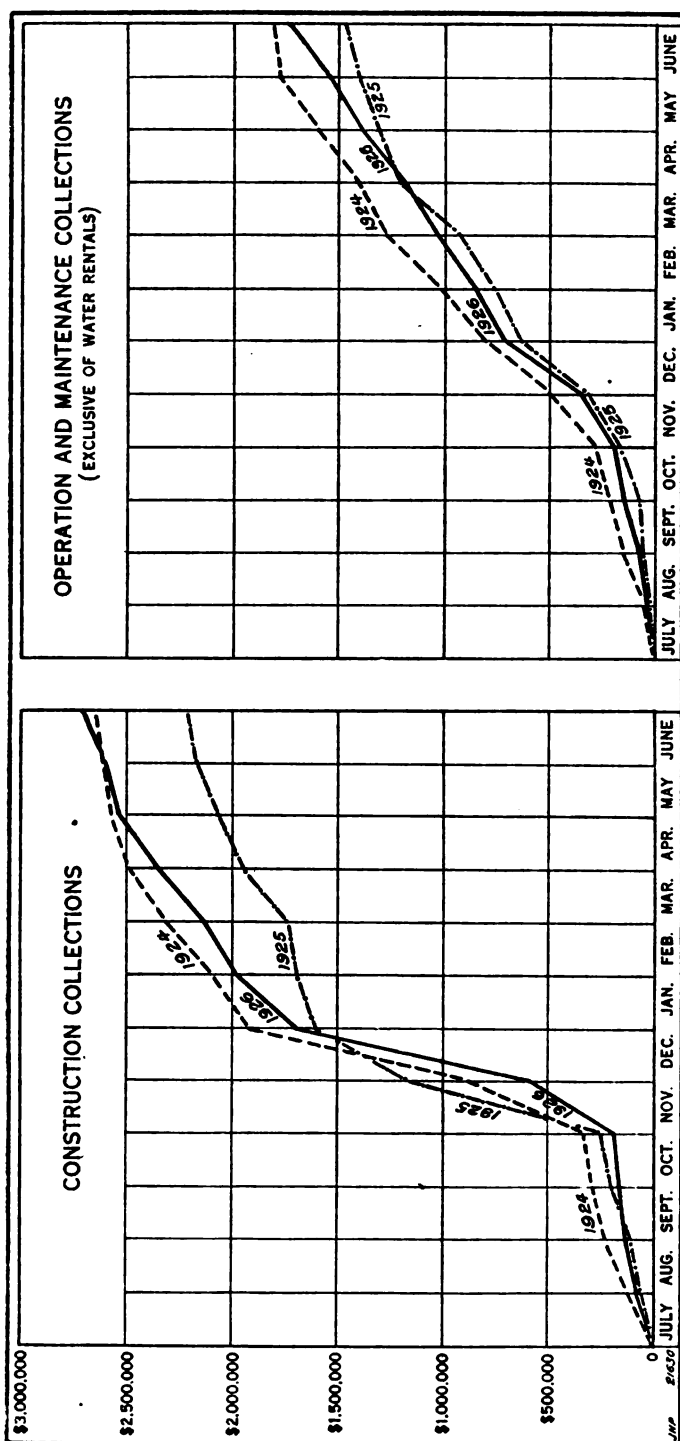
simply as soil exploiters remains to be seen. On the Frannie division there were no new settlers and development is indicated only by the increased crop production of those remaining.

### **COLLECTION OF CHARGES**

The policy was continued of insistence on the payment of charges. As a result the collections for construction and for operation and maintenance for the fiscal year 1926 exceeded those for the previous year. The accompanying chart gives a graphic comparison of the collections during the fiscal years 1924, 1925, and 1926.

### **STATUS OF NEW REPAYMENT CONTRACTS**

The accompanying table shows the progress being made in negotiating new contracts between the department and the various projects, providing for turning over the operation of the projects to the water users, new plan of repayment, and new construction.





## Status of new contracts between the United States and districts or associations on reclamation projects, June 30, 1926

Project	Contractor	Form of contract approved by Secretary of Interior	Election held by water users	Confirmatory proceedings by court (date of decree)	Date of contract	Purpose of contract
Boise	Nampa and Meridian irrigation district	Sept. 9, 1925	Nov. 10, 1925	Feb. 10, 1926	Mar. 2, 1926	Turning project over to water users, and making construction repayments on crop-return basis as authorized by act Dec. 5, 1924.
Do.	Black Canyon irrigation district	Oct. 8, 1925	Mar. 22, 1926	May 24, 1926	Apr. 21, 1926	Do.
Do.	Boise-Kuna irrigation district	Jan. 14, 1926	Mar. 13, 1926	Apr. 24, 1926	Mar. 20, 1926	Do.
Do.	Wildor irrigation district	Feb. 10, 1926	Mar. 20, 1926	Apr. 24, 1926	Apr. 6, 1926	Do.
Do.	Big Bend irrigation district	Jan. 19, 1926	Mar. 9, 1926	Apr. 20, 1926	Mar. 25, 1926	Do.
Minidoka	Burdley irrigation district	Feb. 1, 1926	Feb. 26, 1926	Apr. 17, 1926	Mar. 15, 1926	Do.
King Hill	King Hill irrigation district	Oct. 9, 1925	Dec. 8, 1925	Apr. 17, 1926	Mar. 2, 1926	Do.
Unadilla	West Extension irrigation district	Feb. 25, 1926	Apr. 10, 1926			Do.
Do.	West Extension irrigation district	Mar. 22, 1926	May 1, 1926			Do.
North Platte	Interstate division	Feb. 13, 1926				Do.
Do.	Goshute irrigation district, Fort Laramie division	June 11, 1926				Do.
Do.	Northport irrigation district, Northport division	June 4, 1926				Do.
Sun River	Greenfields irrigation district	Feb. 16, 1926	(1)		June 22, 1926	Construction Gibson Reservoir and providing for payment of costs.
Yakima	Sunnyside irrigation district	Mar. 25, 1926	May 1, 1926		June 14, 1926	New plan of payment of construction costs.
Do.	Snipes Mountain irrigation district	Apr. 29, 1926			June 11, 1926	Do.
Shoshone	Shoshone irrigation district, Garland division	Apr. 1, 1926				Turning project over to water users, and making construction repayments on crop-return basis as authorized by act Dec. 5, 1924.
Strawberry	Strawberry Water Users' Association, entire project	Sept. 17, 1925				Do.
Yakima	Kittitas reclamation district	Dec. 30, 1924	Feb. 11, 1925	Mar. 10, 1925	Dec. 19, 1925	Construction of Kittitas division, Yakima project and payment of construction costs.
Vale	Warm Springs irrigation district	Sept. 14, 1925		June 1, 1926		Purchase by United States of interest in Warm-springs Reservoir.
Do.	Vale, Oreg., irrigation district	June 29, 1926				Construction of Vale project and payment of construction costs.
Baker	Lower Powder River irrigation district	Jan. 20, 1925				Beginning construction Baker project and providing for payment of construction costs.
Salt Lake Basin	Echo Reservoir and Weber-Provo Canal	Sept. 15, 1925				Construction Echo Reservoir and Weber-Provo diversion canal and providing for payment of costs.
Owyhee	Slide irrigation district	May 28, 1926				Construction of Owyhee project and payment of cost thereof.
Do.	Payette-Oregon Slope irrigation district	do.				Do.
Do.	Owyhee irrigation district	do.				Do.
Do.	Ogem irrigation district	do.				Do.

1 No election required under Montana law.

## PROPOSED NEW PROJECTS

The following comprise projects for which construction funds have been appropriated subject to provisions not yet met:

### BAKER PROJECT, OREGON

Of the original appropriation of \$500,000 made in 1924 with unexpended balances reappropriated from year to year, approximately \$483,000 remains available.

The feasibility of this project, as required by the act of December 5, 1924, is in doubt. In the absence of convincing evidence of feasibility, nothing has been done toward beginning construction.

### VALE PROJECT, OREGON

The appropriation for the fiscal year 1926 carried \$500,000 for this project for investigation and commencement of construction, the latter being subject (a) to consummation of contract with a district for the repayment of construction costs and (b) appraisal of private lands to be benefited by the proposed works with agreements for sale thereof at the appraised prices. Of the above amount, \$200,000 was made available for purchase of a share of Warm Springs Reservoir.

The Vale irrigation district has been formed and is considering an approved draft of contract providing for repayment of construction costs in 40 years after water becomes available, in accordance with the appropriation act for the fiscal year 1927. The sale of one-half of Warm Springs Reservoir by the Warm Springs irrigation district to the United States has been confirmed by the local circuit court and is now before the Oregon Supreme Court for review.

Topographic mapping of the project has been completed and all lands classified. An appraisal has also been completed and approved by the department. Additional surveys of the canal lines will be required prior to actual construction.

### OWYHEE PROJECT, OREGON-IDAHO

Of an original appropriation of \$315,000 under the act of December 5, 1924, for investigation and construction, with balances reappropriated for the succeeding fiscal years, there remains \$286,000 unexpended. Construction has been made conditional on (a) approval of the project by the Secretary and the President, (b) classification of lands and equitable apportionment of construction costs in accordance with their productive value, (c) appraisal of private lands and provision for control of sales at appraised value, (d) repayment contract with districts providing for repayment in not more than 40 years after water becomes available.

All project lands not covered by existing pumping plants from Snake River or the Owyhee Canal from Owyhee River have been classified as to their irrigability by 40-acre tracts. Appraisal thereof by a board consisting of one member selected by the bureau, one by the district, and the third selected by these two, has been completed as to the field work and will shortly be submitted to the department for approval. Detailed topography of the lands is being mapped and will be completed by the end of the calendar year.

The Hole-in-the-Ground dam site, proposed to be utilized by the construction of a dam 354 feet high for storage and diversion purposes, was examined for its water-holding properties by a representative of the Geological Survey and favorably reported on.

The Oregon lands above existing irrigation systems have been organized into an irrigation district and the lands above the Gem district in Idaho annexed to the latter district. With the exception of a few small areas not readily susceptible of inclusion in districts, all lands within the project to be served by its canals have been included in districts which now have under consideration drafts of contracts for repayment of construction costs. The Owyhee Ditch lands will purchase supplemental storage only and will not be so organized.

#### **SPANISH SPRINGS DIVISION, NEWLANDS PROJECT, NEVADA**

In accordance with provisions of the appropriation act of March 3, 1925, all lands of the Southern Pacific Co. have been appraised by one representative of the bureau and one of the company, but such appraisal has not yet been approved by the department. An appraisal and classification has also been made of Indian lands in the Pyramid division but has not yet been approved by the Bureau of Indian Affairs. Classification of all lands in the Spanish Springs division by 40-acre tracts, and detailed topography of all lands in this division, will be completed shortly. A decided shrinkage from earlier estimates of irrigable area, with corresponding reduction in water-supply requirements, has obviated the need of interference with existing power rights on Truckee River. Arrangements for use of power from the Lahontan power plant for pumping purposes on Spanish Springs lands and the joint use of Truckee Canal by the Spanish Springs lands and Carson lands are under consideration with the Truckee-Carson irrigation district comprising present irrigated lands.

Of the appropriation of \$500,000 for investigation and commencement of construction provisionally made available on March 3, 1925, about \$470,000 remained available at the end of the fiscal year.

#### **SALT LAKE BASIN PROJECT, UTAH**

In connection with the proposed Echo Reservoir, surveys for the relocation of highways and the Union Pacific Railroad have been completed and drafts of contract for reconstruction are under consideration. Construction work on these revisions, with the exception of track laying and surfacing of the railroad line, will be included in the contract for the construction of the dam. Properties to be submerged by the reservoir have been surveyed, mapped, and appraised in anticipation of purchase when construction is authorized.

During the year the dam site was explored further to determine foundation conditions, with the result that more permeable foundation conditions were found than had been previously anticipated. Final designs, plans, and specifications for this structure have been prepared and advertisement for bids will be issued as soon as construction is authorized.

Additional surveys and tests of materials to be removed in the summit cut of the Weber-Provo diversion canal have been made for determination of the best location for this canal.

The Weber River Water Users' Association has been organized to contract with the United States for the construction of the Echo Reservoir and the Weber-Provo diversion canal, and the articles of incorporation have been approved. An active campaign for subscriptions has been in progress and at the close of the year it appeared that the requirement of the commissioner that 80 per cent of the total 74,000 shares be subscribed before authorization of construction, would be met at an early date.

The requirements of the department with regard to proper form of obligation on the part of the subscribing canal companies and other organizations necessitate the amending of their articles of incorporation in many cases.

Investigations of Utah Lake control are still in progress.

The sum of \$900,000 appropriated for investigation and commencement of construction by the act of March 3, 1925, together with the unexpended balance of the \$375,000 appropriation made in the act of December 5, 1924, and unappropriated in the act of March 3, 1925, has been reappropriated for the fiscal year 1927.

#### **KITTITAS DIVISION, YAKIMA PROJECT, WASHINGTON**

Conditions precedent to construction having been fulfilled, this project has been transferred to the class of primary projects and is discussed under the Yakima project.

# DISCUSSION OF PROJECTS

## PRIMARY PROJECTS

### ARIZONA, SALT RIVER PROJECT

[Operated by the Salt River Valley Water Users' Association]

The Salt River project irrigates 230,700 acres of land of the shareholders of the Salt River Valley Water Users' Association and 70,076 acres on a rental basis and under the Warren Act, all located in the Salt River Valley, Maricopa County, Ariz. The range of temperature over a period of 35 years was from 22° to 117° with an average annual rainfall of 8.34 inches. The soil varies from sandy to silt and clay loam of great fertility. Farming is highly diversified, the climate permitting cultivation during the entire year. The major crops are cotton, alfalfa, grain, citrus and deciduous fruits, cantaloupes, grapes, small fruits, vegetables, dairy products, etc. Local, Pacific coast, and eastern markets absorb surplus production.

#### *Operation and settlement data, Salt River project*

Item	1920-21	1921-22	1922-23	1923-24	1924-25
Acreage for which works were prepared to supply water.....	213,168	213,170	213,170	236,000	236,000
Acreage irrigated.....	203,346.50	204,590.50	204,590	233,500	230,700
Miles of canals operated.....	863.35	863.35	867.9	975.55	981.76
Water diverted (acre-feet) <sup>1</sup> .....	1,059,909	1,215,085	1,159,555	1,397,614	1,124,189
Water delivered to land (acre-feet) <sup>2</sup> .....	533,594	566,176	590,613	741,959	647,759
Acre-feet per acre for area under cultivation.....	2.635	2.770	2.89	3.20	2.74
Total number of farms on project (when completed) <sup>3</sup> .....	5,000	5,000	5,500	6,500	7,000
Number of farms reported <sup>4</sup> .....	5,000	5,000	5,500	6,300	6,635
Operated by owners or managers <sup>4</sup> .....			4,800	5,400	5,700
Operated by tenants <sup>4</sup> .....			900	900	935
Population <sup>4</sup> .....	33,600	36,000	36,000	39,000	41,000
Number of towns <sup>4</sup> .....	14	14	12	12	12
Population.....	42,500	44,000	51,000	55,000	57,000
Total population of towns and farms.....	76,100	80,000	87,000	94,000	98,000
Number of public schools.....	60	60	63	65	67
Number of churches.....	65	65	65	66	66
Number of banks.....	20	20	15	15	15
Total capital stock.....	\$1,755,500	\$1,755,500	\$1,600,000	\$1,600,000	1,600,000
Amount of deposits.....	\$17,776,336	\$21,331,600	\$25,000,000	\$25,580,000	30,000,000
Number of depositors.....	37,000	38,500	40,000	41,000	42,000

<sup>1</sup> Net water diverted for shareholders of the Salt River Valley Water Users' Association, inclusive of waste and water diverted for power, but not including water delivered to canal systems not a part of the project.

<sup>2</sup> Amount of water per acre actually charged for; 20 per cent less than the amount of water delivered to the land.

<sup>3</sup> Estimated.

<sup>4</sup> Includes four post offices outside incorporated towns and villages.

#### *Appropriations*

Fiscal year 1926:	
Congressional authorizations.....	\$5,000
Unencumbered balance, June 30, 1926.....	5,000
Fiscal year 1927: Amount specified in appropriation acts.....	3,000

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$14,662,083.96	\$9,450.28	\$14,671,484.24
Less collections.....	7,210,775.38	.....	7,210,775.38
Net investment, June 30, 1925.....	7,451,268.58	9,450.28	7,460,708.86

*Construction account*

	To June 30, 1926
Cost of irrigation works:	
Original construction.....	\$11,292,362.55
Value of works taken over.....	1,451,860.04
Total construction cost.....	12,744,222.59
Operation and maintenance prior to public notice (net).....	115,993.50
	\$12,860,216.09
Less:	
Construction revenues.....	2,312,090.81
Nonreimbursable cost.....	382,097.31
	2,694,194.12
Total to be repaid by water users.....	10,166,021.97
Repayment:	
Contract: Salt River Valley Water Users' Association.....	10,166,021.97

*Status of current accounts receivable June 30, 1926*

	Due		Collected	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
Construction:				
Water-right charges.....	\$643,862.05	\$2,950,746.01	\$643,862.05	\$2,950,746.01
Miscellaneous:				
Rentals of irrigation water.....		2,246,726.01		2,246,726.01
Rentals of power and light.....		998,411.03		998,411.03
Rentals of grazing and farming lands.....		19,373.14		19,373.14
Construction interest and penalties.....	26,980.10	136,664.41	26,980.10	136,664.41
Other.....				858,854.78
Gand total collections.....			670,842.15	7,210,775.38

**ARIZONA-CALIFORNIA, YUMA PROJECT**

The Yuma project, exclusive of the Mesa division, comprises about 65,000 acres of irrigable land for a distance of 38 miles from the boundary between Arizona and Mexico, in Yuma County, Ariz.; and Imperial County, Calif. The soils are rich alluvium bottom land. The principal crops are cotton and alfalfa. The irrigation season is 365 days a year. The average temperatures for 29 years are: High, 116°; low, 28° F.; rainfall, 40-year average, 3.1 inches.

The Mesa division comprises 45,000 acres of mesa land lying about 80 feet above the valley; of this area a distribution system has been provided for 3,810 acres. There are 675 acres under development and 1,080 acres of unsold land. The soil is sandy and the climate frostless and well adapted to the growing of citrus and other semitropical fruits.

*Operation and settlement data, Yuma project, Arizona-California*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	65,000	67,200	70,500	70,500	70,500
Acreage irrigated.....	52,400	53,970	<sup>2</sup> 53,925	<sup>3</sup> 53,843	<sup>4</sup> 54,410
Miles of canal operated.....	323.2	345	370.26	370.26	371
Water diverted (acre-feet) <sup>1</sup> .....	482,000	546,634	672,867	665,898	647,149
Water delivered to land (acre-feet).....	140,900	140,056	154,271	185,373	173,729
Acre-feet to acre for area under cultivation.....	2.69	2.59	2.90	3.44	3.05
Total number of farms on project (when completed).....	5,750	5,750	5,750	6,000	6,000
Number of irrigated farms.....	1,211	1,298	1,207	1,304	1,404
Operated by owners and managers.....	825	762	675	682	730
Operated by tenants.....	386	536	532	642	674
Population.....	4,800	4,200	3,800	3,350	3,640
Number of towns.....	5	5	5	5	5
Population.....	6,665	6,700	5,730	6,990	8,600
Total population of towns and farms.....	11,465	10,900	9,530	10,240	12,240
Number of public schools.....	16	16	16	16	14
Number of churches.....	<sup>5</sup> 23	<sup>6</sup> 23	<sup>6</sup> 24	15	15
Number of banks.....	5	5	5	5	4
Total capital stock.....	\$230,000	\$280,000	\$280,000	\$280,000	\$180,000
Amount of deposits.....	\$1,927,000	\$3,095,800	\$3,378,330	\$2,664,296	\$2,858,200
Number of depositors.....	5,900	6,382	6,970	8,492	8,700

<sup>1</sup> Includes Yuma Mesa.<sup>2</sup> Project proper, 53,270; difference is Yuma Mesa.<sup>3</sup> Project proper, 53,180; difference is Yuma Mesa.<sup>4</sup> Project proper, 55,904; difference is Yuma Mesa.<sup>5</sup> Of the water diverted from 100,000 to 350,000 acre-feet each year are wasted, the largest part of which flows in to the Colorado River at the California spillway near Yuma and can be diverted for irrigation below this point.<sup>6</sup> Total religious organizations; figures for 1924 and 1925 are for church buildings only.*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$708,169.60
Disbursements.....	\$481,721.66	
Liabilities outstanding.....	72,981.04	
		554,002.70
Unencumbered balance June 30, 1926.....		148,566.30
Fiscal year 1927: Amounts specified in appropriation acts.....		400,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$13,391,560.09	\$158,366.50	\$13,549,926.59
Less collections.....	5,138,343.01		5,138,343.01
Net investment June 30, 1926.....	8,253,217.08	158,366.50	8,411,583.57

*Construction account*

	Fiscal year 1926	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction.....	<sup>1</sup> \$953. 25	\$8, 746, 678. 53
Supplemental construction.....	322, 740. 32	428, 867. 71
Total construction cost.....	321, 787. 07	\$9, 175, 546. 24
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 422. 91	371, 194. 58
Operation and maintenance deficits and arrearages to be repaid with construction.....	976. 25	2, 921. 96
		374, 116. 54
		9, 549, 662. 78
<b>Less:</b>		
Contributed funds.....		101, 113. 89
Construction revenues.....	2, 719. 10	60, 184. 20
		161, 298. 09
Total to be repaid by water users.....	319, 621. 31	9, 388, 364. 69
<b>Contracted repayments:</b>		
Water-right contracts (Individuals).....	394, 078. 30	4, 795, 702. 22
Contract—Imperial Irrigation district.....		1, 600, 000. 00
Total.....	394, 078. 30	6, 395, 702. 22

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
<b>Operation and maintenance cost.....</b>	\$267, 558. 42	\$2, 652, 690. 92	\$326, 422. 91	\$2, 835, 178. 94
<b>Operation and maintenance returns:</b>				
Contracted.....	314, 827. 20	2, 100, 557. 68	305, 419. 27	2, 099, 680. 22
Penalties.....	11, 074. 09	59, 806. 62	13, 002. 78	68, 510. 86
Discounts (contra).....	7, 787. 01	27, 826. 86	6, 362. 14	34, 211. 87
Miscellaneous revenues.....	14, 524. 67	117, 534. 66	20, 041. 33	137, 613. 95
Subtotal.....	332, 638. 95	2, 250, 072. 10	338, 101. 24	2, 271, 593. 16
<b>Other credits:</b>				
Operation and maintenance deficits and arrears to be repaid with construction.....	976. 25	2, 921. 96	976. 25	2, 921. 96
Total.....	333, 615. 20	2, 252, 994. 06	339, 077. 49	2, 274, 515. 12
<b>Results:</b>				
Excess.....	66, 056. 78		12, 654. 58	
Deficit.....		399, 696. 86		599, 668. 72



## Status of current accounts receivable as of June 30, 1926

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.	\$351,962.48	\$2,136,309.86	\$345,785.33	\$1,996,485.54		\$4,024.28	\$135,800.04
Contributed funds.		101,113.89		101,113.89			
Total.	351,962.48	2,237,423.75	345,785.33	2,097,599.43		4,024.28	135,800.04
Charges paid in advance.			39.51	877.79		146.81	
Refunds.				1,583.60			
Operation and maintenance:							
Water-right charges, project lands (64,621.91 acres).	\$306,419.27	\$2,099,680.22	\$226,789.87	\$1,817,310.81	\$6,362.14	\$9,336.28	\$243,033.13
Penalties and interest.	13,002.78	68,510.86	12,426.54	66,717.36		399.69	1,393.81
Charges paid in advance.			\$628.80	106.80		559.20	
Refunds.				248.91			
Miscellaneous:							
Rentals of irrigation water.	22,944.51	469,271.95	21,563.51	463,427.38	4,282.14	4,574.15	1,270.42
Rentals, grazing and farming lands.	3,164.08	20,139.65	3,274.55	19,977.00			162.65
Construction penalties and interest.	17,296.28	121,159.04	18,304.83	119,859.48			1,299.56
Construction forfeitures.			361.60	3,915.78			
Other.			13,726.96	546,718.67			1,978.34
Grand total collections.			641,643.81	5,138,343.01			

1 Note:

	Construction	Operation and maintenance
Actual accruals for year.	\$355,320.96	\$307,638.34
Less deductions due to cancellations, relinquishments, and adjustments.	1,380.19	1,216.50
Deferred under section 2, act of May 9, 1924.	1,978.29	1,002.57
Net accruals.	351,962.48	305,419.27

1 Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 6.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 11.6 per cent of total accruals.

## YUMA AUXILIARY PROJECT, ARIZONA

(MESA DIVISION)

## Appropriations

	Yuma auxiliary fund	Reclamation fund
Fiscal year 1926:		
Congressional authorizations.	\$26,338.67	\$186,659.73
Disbursements.	131.86	73,594.06
Liabilities outstanding.		8,583.07
Unencumbered balance June 30, 1926.	26,206.81	104,482.60
Fiscal year 1927: Amount specified in appropriation acts.		72,000.00

*Voucher transactions*

	Reclama- tion fund	Yuma aux- iliary fund	Increase of compensa- tion (net)	Total
Disbursements and net transfers.....	\$74,841.16	\$788,561.27	\$15,851.45	\$879,253.88
Less collections.....	45.00	856,612.47		856,657.47
Net investment June 30, 1926.....	74,796.16	<sup>1</sup> 68,051.20	15,851.45	22,596.41

<sup>1</sup> Contra.*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$27,506.74	\$366,813.00
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 60.00	<sup>1</sup> 100.00
Less construction revenues.....	17.24	\$366,713.00
Total to be repaid by water users.....	27,429.50	1,065.47
Contracted repayments: Water-right contracts (individuals).....	<sup>1</sup> 108,669.05	865,627.55
		843,807.28

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$53,627.13	\$161,771.31	\$43,353.77	\$183,332.81
Operation and maintenance returns:				
Contracted.....	48,966.08	174,845.04	44,256.18	215,808.14
Penalties.....		537.74		537.74
Discounts (contra).....		1,106.79		1,106.79
Miscellaneous revenues.....	627.05	777.05	826.05	1,483.05
Totals.....	49,593.13	175,053.04	45,082.23	216,722.14
Results:				
Excess.....		13,281.73	1,728.46	33,389.33
Deficit.....	4,034.00			

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 1926	
Construction:							
Water-right charges	\$ 96,980.00	\$687,810.00	\$ 13,348.74	\$537,176.82			\$150,632.18
Land sales	15,082.25	91,961.28	2,071.67	73,329.42			18,631.88
Total	112,062.25	779,771.28	15,420.41	610,506.24			169,264.04
Interest	51.00	36,028.14	51.00	36,028.14			
Forfeitures	3,632.20	27,717.86	3,632.20	27,717.86			
Refunds				1,328.35			
Operation and maintenance:							
Water-right charges	44,256.18	215,808.14	36,948.46	131,694.02		\$1,106.79	83,097.23
Interest		537.74		537.74			
Charges paid in advance			7.00				
Miscellaneous:							
Rentals of irrigation water	886.05	1,583.05	837.05	1,102.05			481.00
Other miscellaneous collections			342.84	47,743.07			23.96
Grand total collections			26,384.14	856,657.47			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 21.9 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 38.5 per cent of total accruals.

**CALIFORNIA, ORLAND PROJECT**

The Orland project is located in Glenn and Tehama Counties, with reservoir in Colusa County. The average elevation above sea level is 250 feet; the mean seasonal rainfall, 18 inches; and the temperature range, 19° to 116° F. The soil is sandy and gravelly loam, silt loam, and clay loam. The principal products are alfalfa, milo, citrus and other fruits, nuts, and vegetables. The irrigation season usually begins March 15 and ends September 30.

*Operation and settlement data, Orland project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water	\$ 20,657	\$ 20,665	\$ 20,665	\$ 20,659	\$ 20,659
Acreage irrigated	14,697	15,119	15,500	11,962	13,955
Miles of canal operated	146	146	146	121	142
Water stored (acre-feet)	13,680	63,460	36,250	21,790	51,730
Water diverted (acre-feet)	68,867	76,632	73,191	17,023	76,483
Water delivered to land (acre-feet)	44,200	50,589	47,363	10,451	47,298
Per acre of land irrigated (acre-feet)	3.01	3.34	3.06	0.88	3.39
Total number of farms on project	936	968	988	998	994
Population	2,250	2,275	2,300	2,100	1,900
Number of irrigated farms	663	693	703	673	690
Operated by owners or managers	589	568	569	562	543
Operated by tenants	74	125	134	111	147
Population	1,892	1,909	1,945	1,750	1,694
Number of towns	1	1	1	1	1
Population	1,700	1,700	1,700	1,700	1,700
Total population	3,950	3,975	4,000	3,800	3,600
Number of public schools	10	10	10	10	9
Number of churches	7	7	7	7	7
Number of banks	2	2	2	2	2
Total capital stock	\$171,000	\$171,000	\$171,000	\$171,000	\$171,000
Amount of deposits	\$896,000	\$995,000	\$1,107,000	\$1,041,000	\$1,090,000
Number of depositors	2,800	2,900	3,000	2,950	2,970

<sup>1</sup> Includes 320 acres of vested water rights and 162 acres of school and town sites.<sup>2</sup> Includes 320 acres of vested water rights and 171 acres of school and town sites.

*Appropriations*

<b>Fiscal year 1926:</b>		
Congressional authorizations.....		\$84,000.00
Disbursements.....	\$50,586.81	
Liabilities outstanding.....	27,092.34	
		77,679.15
Unencumbered balance June 30, 1926.....		6,320.85
<b>Fiscal year 1927: Amount specified in appropriation acts.....</b>		<b>635,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,581,444.56	\$31,825.28	\$1,613,269.84
Less collections.....	892,173.94		892,173.94
Net investment June 30, 1926.....	689,270.62	31,825.28	721,095.90

*Construction account*

	Fiscal year 1926	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction.....	\$1,364.64	\$921,767.84
Supplemental construction.....	78,155.35	299,616.54
Total construction cost.....	79,519.99	1,221,384.38
Operation and maintenance prior to public notice (net).....	148.50	12,026.99
Less construction revenues.....	1,035.66	
Total to be repaid by water users.....	78,335.83	1,192,747.01
Contracted repayments: Water-right contracts (individuals).....		1,119,215.25

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$27,943.04	\$290,867.24	\$26,167.02	\$306,023.91
Operation and maintenance returns:				
Contracted.....	34,329.22	313,311.41	34,327.95	313,310.12
Penalties.....	135.87	210.01	302.17	427.51
Discounts (contra).....	109.87	13,092.62	1,371.72	14,397.66
Miscellaneous revenues.....	660.26	2,211.70	563.76	2,284.45
Total.....	35,015.18	302,640.50	33,812.16	301,624.42
Results:				
Excess.....	7,072.14	11,773.26	7,645.14	
Deficit.....				4,399.49

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$66,552.92	\$437,838.50	\$82,793.60	\$423,067.18			\$14,781.32
Charges paid in advance.....				5,385.16			
Operation and maintenance:							
Water-right charges, project lands (20,167.55 acres).....	34,327.95	313,310.12	34,230.13	293,419.52	\$1,371.72	\$14,397.66	5,492.94
Penalties and interest.....	302.17	427.51	302.17	427.51			
Refunds.....				17.98			
Miscellaneous:							
Rentals of irrigation water.....	220.50	120,825.00	220.50	120,825.00			
Rentals of grazing and farming lands.....	1 8,171.78	8,251.28	1 7,571.78	7,651.28			600.00
Construction forfeitures.....				196.33			
Construction penalties and interest.....	3,668.47	4,637.40	3,668.47	4,637.40			
Other.....			1 6,598.46	36,556.58			
Grand total collections..			122,188.19	892,173.94			

<sup>1</sup> Takes into account rentals of purchased lands not previously reported. Actual accruals for year, \$664.78; collections, \$64.78.

<sup>2</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 3.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 1.8 per cent of total accruals.

**COLORADO, GRAND VALLEY PROJECT**

The Grand Valley project, irrigated from the Colorado River, is located in Mesa County in west central Colorado. It is traversed by the main line of the Denver & Rio Grande Western Railroad and by two transcontinental highways. With an average elevation of 4,700 feet the temperature ranges from 100° to -10° F. An average annual rainfall of 8.3 inches occurs. The principal crops are alfalfa, sugar beets, grain, potatoes, and fruit.

*Operation and settlement data, Grand Valley project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau is prepared to supply water.....	1 38,400	1 38,400	2 48,400	2 46,750	2 48,800
Acreage irrigated.....	1 20,590	1 20,672	2 23,770	2 25,250	2 25,500
Miles of canals operated.....	175	175	175	175	175
Water diverted, acre-feet.....	1 145,416	1 166,404	2 247,267	2 272,824	2 264,700
Water delivered to land (acre-feet).....	1 43,978	1 46,290	2 48,526	2 58,375	2 56,739
Per acre of land irrigated.....	1 3.57	1 3.74	2 3.77	2 4.34	2 4.21
Total number of farms on project <sup>1</sup> .....	825	825	825	825	825
Population.....	1,064	1,134	1,185	1,215	1,075
Number of irrigated farms.....	402	387	396	453	455
Operated by owners or managers.....	264	217	229	296	242
Operated by tenants.....	138	179	167	157	213
Population.....	1,064	1,134	1,185	1,215	1,075
Number of towns.....	6	6	6	6	6
Population <sup>2</sup> .....	11,246	11,246	11,246	11,246	11,246
Total population in towns and on farms <sup>3</sup> .....	12,310	12,380	12,431	12,461	12,321
Number of public schools <sup>4</sup> .....	23	24	24	24	24
Number of churches <sup>5</sup> .....	28	28	28	32	32
Number of banks <sup>6</sup> .....	7	7	6	6	5
Total capital stock <sup>1</sup> .....	\$465,000	\$468,700	\$452,300	\$445,000	\$382,000
Amount of deposits <sup>2</sup> .....	\$3,621,420	\$3,520,500	\$3,237,000	\$3,927,200	\$4,000,000
Total number of depositors <sup>3</sup> .....	10,975	8,825	9,850	12,600	10,000

<sup>1</sup> Includes data for Palisade and Mesa County irrigation districts.

<sup>2</sup> Includes data for Orchard Mesa, Palisade, and Mesa County irrigation districts.

<sup>3</sup> Orchard Mesa, Palisade, and Mesa County districts included; project proper, 30,000 acres irrigable; 13,490 acres irrigated.

<sup>4</sup> Project lands only.

<sup>5</sup> Estimated.

<sup>6</sup> These items include areas adjacent to project.

*Appropriations*

<b>Fiscal year 1926:</b>			
Congressional authorizations.....			\$251,000.00
Disbursements.....	\$113,664.25		
Liabilities outstanding.....	7,946.92		
			121,611.17
Unencumbered balance June 30, 1926.....			129,388.83
<b>Fiscal year 1927: Amount specified in appropriation acts.....</b>			<b>100,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$5,281,509.71	\$77,512.18	\$5,359,021.89
Less collections.....	520,448.41		520,448.41
Net investment June 30, 1926.....	4,761,061.30	77,512.18	4,838,573.48

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$89,914.31	\$4,723,070.55
Operation and maintenance prior to public notice (net).....	102.15	112,403.08
Less construction revenues.....	365.06	\$4,836,473.63
		60,008.76
Total to be repaid by water users.....	89,447.10	4,776,464.87
Contracted repayments: Contract, Orchard Mesa irrigation district.....		1,000,000.00

¹ Contra.

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Miscellaneous:							
Rentals of irrigation water.....	\$47,996.85	\$375,720.17	\$60,722.52	\$355,907.08	\$779.00	\$6,234.13	\$13,578.96
Rentals grazing and farming lands.....	80.00	424.00	80.00	374.00		7.50	42.50
Other.....			16,194.83	164,167.33			6,032.17
Grand total collections.....			76,997.35	520,448.41			

**COLORADO, UNCOMPAGHRE PROJECT**

The Uncompahgre project is in southwestern Colorado, in Montrose and Delta Counties, on the Denver & Rio Grande Western Railroad. The irrigation season extends generally from April 1 to October 31—214 days—in all Government canals. The average elevation of the irrigable area is 5,500 feet above sea level; the average annual precipitation on the project for 31 years, 9.69 inches; and the average range of temperature, 10° to 95° F. The soils of the irrigable area are red sandy gravel, adobe, and clay loams. The principal products are alfalfa, grain, sugar beets, potatoes, onions, fruits, and other vegetables. The principal markets are Denver, Omaha, Kansas City, and the West for livestock; Denver, Missouri River points, and Texas for fruit, potatoes, and onions.

*Operation and settlement data, Uncompahgre project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	97,410	97,410	97,060	96,510	94,819
Acreage irrigated.....	63,760	64,730	64,320	63,350	61,687
Miles of canal operated.....	453	467	489	532	550
Water diverted (acre-feet).....	446,225	427,706	439,452	379,144	430,781
Water delivered to land (acre-feet).....	415,599	422,398	328,877	303,814	298,025
Per acre of land irrigated (acre-feet).....	6.52	6.52	5.11	4.89	4.84
Total number of farms on project.....	2,000	2,000	2,000	2,000	2,000
Population.....	6,166	6,149	6,097	5,822	6,082
Number of irrigated farms.....	1,639	1,624	1,694	1,599	1,754
Operated by owners or managers.....	941	944	962	911	860
Operated by tenants.....	698	680	732	688	894
Population.....	6,166	6,149	6,097	5,822	6,082
Number of towns.....	3	3	3	3	3
Population.....	7,450	7,450	7,450	7,400	7,400
Total population in towns and farms.....	13,616	13,599	13,547	13,222	13,482
Number of public schools.....	27	27	26	26	29
Number of churches.....	27	27	27	27	27
Number of banks.....	8	7	6	6	6
Total capital stock.....	\$618,250	\$550,100	\$505,136	\$505,136	\$505,136
Amount of deposits.....	\$3,219,773	\$2,930,700	\$3,232,626	\$3,301,367	\$3,499,205
Number of depositors.....	11,000	11,250	11,250	11,250	11,250

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$163,000.00
Disbursements.....	\$128,753.82	
Liabilities outstanding.....	11,230.60	
		139,984.42
Unencumbered balance June 30, 1926.....		23,015.58
Fiscal year 1927: Amount specified in appropriation acts.....		145,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$3,422,574.55	\$103,089.22	\$3,525,663.77
Less collections.....	1,926,259.05		1,926,259.05
Net investment June 30, 1926.....	6,496,315.50	103,089.22	6,599,404.72

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$264.00	\$6,364,114.74
Value of works taken over.....		74,062.17
Total construction cost.....	264.00	6,438,176.91
Operation and maintenance prior to public notice (net).....	1,391.22	300,321.93
Less:		\$6,738,498.84
Construction revenues.....	6,307.19	23,358.05
Nonreimbursable cost.....		47,370.81
		70,728.86
Total to be repaid by water users.....	5,179.97	6,657,769.98
Contracted repayments: Water-right contract Uncompahgre Water Users' Association.....		6,713,584.50

1 Contra.

## Operation and maintenance account

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$131,955.39	\$413,801.13	\$137,433.93	\$495,276.53
Operation and maintenance returns:				
Contracted.....	132,827.44	428,213.79	132,677.08	427,723.44
Penalties.....	5,264.09	5,758.64	6,938.07	9,234.26
Discounts (contra).....	2,899.77	8,883.16	2,870.83	8,928.48
Miscellaneous revenues.....	2,790.82	6,840.28	2,980.67	9,741.90
Total.....	137,982.58	431,929.45	139,724.99	437,771.12
Results:				
Excess.....	6,027.19	18,128.32	2,291.06	
Deficit.....				57,505.41

## Status of current accounts receivable as of June 30, 1926

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges	\$106,701.08	\$477,324.04	\$118,059.28	\$195,892.97	\$7,851.63	\$51,117.51	\$230,313.56
Charges paid in advance			70.42	133.58	4,826.11	29,415.01	
Operation and maintenance:							
Water-right charges, project lands (94819 acres)	132,677.08	427,723.44	129,468.57	281,588.04	7,570.18	20,373.93	125,761.47
Penalties and interest	6,938.07	9,234.26	6,943.01	7,560.16	314.71	513.88	1,160.22
Charges paid in advance			32.47	203.75	237.71	438.71	
Miscellaneous:							
Rentals of irrigation water	4,371.89	1,200,004.08	9,705.04	1,173,986.67	69.31	13,047.90	12,969.46
Rentals grazing and farming lands	71.90	314.35	71.90	314.35			
Construction penalties and interest	24,242.49	34,855.09	23,319.33	31,361.03	823.27	1,536.79	1,957.27
Other			1,649.08	235,218.50			3,065.97
Grand total collections			289,254.16	1,926,259.05			

<sup>1</sup> Actual construction accruals for year..... \$109,853.2<sup>1</sup>  
Less deductions due to cancellations, relinquishments, and adjustments..... 3,152.13

Net accruals..... 106,701.08

Actual operation and maintenance accruals..... 133,737.13  
Less deductions due to cancellations, relinquishments, and adjustments..... 1,060.05

Net accruals..... 132,677.08

<sup>2</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 48.3 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1926, 29.4 per cent of total accruals.



## IDAHO, BOISE PROJECT

The Boise project is located in the counties of Ada, Boise, Canyon, and Elmore, Idaho, and Malheur, Oreg. The length of the irrigation season is 184 days, from April 5. The average elevation of the irrigable area is 2,500 feet above sea level. The rainfall at Boise for 62 years averaged 13.53 inches. The average highest recorded temperature for 27 years is 102° F., and the average lowest temperature for the same period is 1° F. The character of the soil is clayey loam, light sandy loam, and sandy loam. The principal products are alfalfa, wheat, oats, clover, potatoes, apples, prunes, and head lettuce. The principal markets are Boise, Nampa, Caldwell, and Meridian, Idaho; Portland, Oreg.; and eastern cities.

*Operation and settlement data, Boise project, Idaho*

Item	1921	1922	1923	1924	1925
Acreage to which bureau was prepared to furnish water.....	<sup>1</sup> 282,831	<sup>1</sup> 283,411	<sup>1</sup> 283,471	<sup>1</sup> 283,580	<sup>1</sup> 283,577
Acreage irrigated.....	<sup>2</sup> 153,000	<sup>2</sup> 155,000	<sup>2</sup> 155,500	<sup>2</sup> 156,000	<sup>2</sup> 156,000
Miles of canal operated.....	1,016	1,056	1,019	1,019	1,019
Water diverted (acre-feet).....	844,195	748,570	896,705	444,593	791,508
Water delivered to land per acre of land irrigated (acre-feet).....	3.67	3.46	3.70	1.77	3.62
Total number of farms on project.....	4,085	4,998	5,000	4,900	4,860
Population.....	16,340	14,700	14,650	14,000	13,840
Number of irrigated farms.....	3,300	3,559	3,600	3,500	3,470
Operated by owners or managers..	2,440	2,896	2,988	2,153	1,900
Operated by tenants.....	860	663	612	1,347	1,510
Population.....	11,550	14,236	10,800	10,800	10,600
Number of towns.....	8	8	8	10	10
Population.....	36,170	36,170	36,270	36,660	36,660
Total population in towns and on farms.	52,510	50,870	50,920	50,660	50,500
Number of public schools.....	28	28	28	46	46
Number of churches.....	56	56	58	58	56
Number of banks.....	16	16	14	13	12
Total capital stock.....	\$2,741,000	\$2,741,000	\$1,750,000	\$1,390,000	\$1,290,000
Amount of deposits.....	\$16,328,000	\$16,707,000	\$15,295,000	\$17,639,000	\$18,800,000
Number of depositors.....	* 30,000	* 30,000	* 30,000	* 31,000	* 31,000

<sup>1</sup> Including partial service to vested water-right land under Warren Act; project proper 144,200 acres.

<sup>2</sup> Acreage served with full water supply.

<sup>3</sup> 113,630 acres covered by crop census, including some Warren Act land.

<sup>4</sup> Includes towns in and adjacent to the project.

<sup>5</sup> Includes schools in and adjacent to the project that use school busses.

<sup>6</sup> Estimated; some banks refuse to give number of depositors.

*Appropriations***Fiscal year 1926:**

Congressional authorizations.....	\$550,000.00
Disbursements.....	\$396,997.53
Liabilities outstanding.....	7,841.13
	<b>404,838.66</b>

Unencumbered balance June 30, 1926.....

Fiscal year 1927: Amount specified in appropriation acts.....

<sup>1</sup> Plus certain unexpended balances of 1926 appropriations.

*Voucher transactions*

	Reclamation fund	Judgments Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$18,244,258.66	\$50,228.93	\$206,859.95	\$18,501,347.54
Less collections.....	5,525,591.74			5,525,591.74
Net investment June 30, 1926.....	12,718,666.92	50,228.93	206,859.95	12,975,755.80

*Construction account*

	Fiscal year 1926	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction.....	\$316, 793. 28	\$14, 202, 516. 36
Value of works taken over.....		29, 812. 50
<b>Total construction cost.....</b>	<b>316, 793. 28</b>	<b>14, 232, 328. 86</b>
<b>Operation and maintenance prior to public notice (net).....</b>		<b>422, 192. 62</b>
<b>Operation and maintenance deficits and arrearages to be repaid with construction.....</b>		<b>9, 698. 31</b>
<b>Less construction revenues.....</b>	<b>8, 084. 32</b>	<b>\$14, 664, 219. 79</b>
<b>Total to be repaid by water users.....</b>	<b>308, 708. 96</b>	<b>215, 390. 12</b>
<b>Contracted repayments: Water-right contracts:</b>		
Individuals.....		7, 516, 786. 12
Warren Act.....		28, 779. 17
Irrigation districts.....	1 598, 999. 05	6, 322, 915. 56
<b>Total.....</b>	<b>1 598, 999. 05</b>	<b>13, 868, 380. 85</b>

1 Contra.

*Operation and maintenance accounts*

## REGULAR

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
<b>Operation and maintenance cost.....</b>	<b>\$205, 688. 48</b>	<b>\$2, 108, 804. 43</b>	<b>\$165, 015. 74</b>	<b>\$2, 178, 473. 13</b>
<b>Operation and maintenance returns:</b>				
Contracted.....	203, 856. 13	2, 117, 471. 39	209, 413. 49	2, 130, 631. 02
Penalties.....	16, 736. 27	60, 784. 78	2, 702. 13	62, 189. 46
Discounts (contra).....	1, 320. 79	46, 207. 13	1, 210. 44	46, 526. 29
Miscellaneous revenues.....	12, 891. 82	135, 318. 49	11, 698. 29	135, 167. 59
<b>Subtotals.....</b>	<b>232, 213. 43</b>	<b>2, 267, 367. 53</b>	<b>222, 603. 47</b>	<b>2, 281, 461. 78</b>
<b>Other credits: Operation and maintenance arrearages to be repaid with construction.....</b>	<b>9, 698. 31</b>	<b>9, 698. 31</b>		<b>9, 698. 31</b>
<b>Total.....</b>	<b>241, 911. 74</b>	<b>2, 277, 065. 84</b>	<b>222, 603. 47</b>	<b>2, 291, 160. 09</b>
<b>Results: Excess.....</b>	<b>36, 223. 26</b>	<b>168, 261. 41</b>	<b>57, 587. 73</b>	<b>112, 686. 96</b>

## DRAINAGE

<b>Operation and maintenance cost.....</b>	<b>\$123, 313. 05</b>	<b>\$455, 535. 13</b>	<b>\$116, 738. 04</b>	<b>\$508, 955. 24</b>
<b>Operation and maintenance returns:</b>				
Contracted.....	138, 626. 79	688, 118. 27	68, 905. 56	687, 732. 77
Penalties.....	13, 067. 68	38, 407. 48	6, 720. 32	38, 610. 09
Discounts (contra).....	1, 266. 27	6, 119. 71	720. 64	6, 123. 43
<b>Total.....</b>	<b>150, 428. 20</b>	<b>720, 406. 04</b>	<b>74, 905. 24</b>	<b>720, 219. 43</b>
<b>Results:</b>				
Excess.....	27, 115. 15	264, 870. 91		211, 264. 19
Deficit.....			41, 827. 80	

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges	\$698,372.29	\$3,781,090.93	\$120,621.95	\$1,955,365.95	-----	\$25,092.00	\$1,800,638.98
Charges paid in advance			1 2,021.78	5,038.02	-----		
Refunds				567.77	-----		
Operation and maintenance (regular):							
Water-right charges, project lands (96,776.08 acres)	129,815.79	1,349,416.11	24,272.17	868,273.18	\$964.21	28,650.20	452,492.73
Warren Act (379.07 approximate acres)	403.18	4,414.62	71.37	2,921.45	3.57	6.91	1,486.26
Irrigation districts (68,331.03 approximate acres)	79,194.52	776,800.29	22,350.07	588,984.76	242.66	17,869.18	169,946.35
Total	209,413.49	2,130,631.02	46,693.61	1,460,179.39	1,210.44	46,526.29	623,925.34
Penalties and interest	2,702.13	62,189.46	2,347.11	31,712.37			30,477.09
Refunds				393.79	-----		
Operation and maintenance (drainage):							
Water-right charges, project lands (96,776.08 acres)	46,426.20	466,045.62	56,552.17	332,689.50	669.35	5,718.20	127,637.92
Rental lands (5,598.50 approximate acres)	2,529.09	21,712.45	2,928.82	14,507.95	51.29	405.23	6,790.27
Irrigation districts (68,331.03 approximate acres)	19,950.27	199,974.70	26,335.12	120,197.62			79,777.08
Total	68,905.56	687,732.77	85,816.11	467,395.07	720.64	6,123.43	214,214.27
Penalties and interest	6,720.32	38,610.09	6,720.32	38,610.09			
Refunds				36.08	-----		
Miscellaneous:							
Rentals of Irrigation water	11,698.29	773,902.06	6,689.02	744,968.07		4,720.50	24,213.49
Rentals power and light	6,196.10	145,366.01		96,424.61	6,196.10	48,941.40	
Rentals grazing and farming lands	1 1,893.25	19,657.75	1 1,301.70	19,559.30			98.45
Construction penalties and interest	8,407.42	122,764.83	5,624.32	68,501.44			54,263.39
Other			9,224.10	636,839.79	-----		2,927.94
Grand total collections			280,413.06	5,525,591.74	-----		

1 Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 47.6 per cent of total accruals. Uncollected regular operation and maintenance charges as of June 30, 1926, 29.3 per cent of total accruals. Uncollected drainage operation and maintenance charges as of June 30, 1926, 31.3 per cent of total accruals.

**IDAHO, KING HILL PROJECT**

(Operated by the King Hill irrigation district)

The King Hill project is located in the counties of Elmore, Twin Falls, Owyhee, and Gooding. The average elevation above sea level is 2,750 feet. During the past 12 years the average annual rainfall was 8.59 inches, the average maximum temperature 107°, and the average minimum temperature 4° F. The soil ranges

from light to heavy sandy loam with some heavy clay. With an irrigation season of 193 days, the project produces principally alfalfa, alfalfa seed, potatoes, grains, fruits in favorable seasons, and stock.

*Operation and settlement data, King Hill project*

Item	1921	1922	1923	1924	1925
Acreage for which the bureau was prepared to supply water	13,648	13,648	16,890	16,890	16,890
Acreage irrigated	5,908	6,440	7,017	6,240	8,026
Miles of canal operated	83.5	91.3	100.1	100.1	98.5
Water diverted (acre-feet)	56,153	61,326	91,834	104,536	40,112
Water delivered to land (acre-feet)	30,028	35,875	41,933	53,984	25,488
Per acre of land irrigated (acre-feet)	5.08	5.57	5.97	8.65	3.17
Total number of farms on project	290	290	290	293	1,293
Population	557	599	598	655	1,655
Total irrigated farms	160	175	184	188	187
Operated by owners or managers	141	131	124	117	97
Operated by tenants	19	44	60	71	90
Number of towns	4	4	4	4	4
Population	1,685	2,052	1,525	1,818	1,818
Total population of towns and farms	2,242	2,651	2,123	2,473	1,2,473
Number of public schools	6	6	6	6	6
Number of churches	5	5	5	5	5
Number of banks	2	1	1	1	1
Total capital stock	\$30,000	\$20,000	\$20,000	\$20,000	1 \$20,000
Amount of deposits	\$319,086	\$275,000	\$290,000	\$286,315	1 \$286,315
Number of depositors	824	800	1,000	950	1,950

1 19 farm owners farming rented lands in connection with their own farms.

*Appropriations*

Fiscal year 1926:		
Congressional authorizations		\$34,500.00
Disbursements	\$21,452.24	
Liabilities outstanding	300.75	
		21,752.99
Unencumbered balance June 30, 1926		12,747.01
Fiscal year 1927: Amount specified in appropriation acts		

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers	\$2,005,553.02	\$103,478.48	\$2,109,031.50
Less collections	128,811.19		128,811.19
Net investment June 30, 1926	1,876,741.83	103,478.48	1,980,220.31

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction		\$1,904,898.80
Less:		
Contributed funds		\$8,025.66
Construction revenues	\$2,159.20	20,161.61
		28,187.27
Total to be repaid by water users	1 2,159.20	1,876,711.53
Contracted repayments: Contract, King Hill irrigation district		2,000,000.00

1 Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$41,036.74	\$156,048.79	\$22,698.35	\$156,621.99
Operation and maintenance returns:				
Contracted.....	33,552.75	157,224.95	32,846.92	157,798.15
Discounts (contra).....		1,519.05		1,519.05
Miscellaneous revenues.....	342.89	342.89	342.89	342.89
Total.....	33,895.64	156,048.79	33,189.81	156,621.99
Results:				
Excess.....			10,491.46	
Deficit.....	7,141.10			

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$40,000.00	\$80,000.00					\$80,000.00
Contributed funds.....		8,025.66		\$8,025.66			
Operation and maintenance: King Hill irrigation district (16,887.81 approximate acres).....	32,846.92	157,798.15	\$160.15	59,192.22		\$1,519.05	97,086.88
Miscellaneous:							
Penalties and interest.....		476.99		476.99			
Other.....			827.78	61,116.32			43.49
Grand total collections.....			987.93	128,811.19			

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 100 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 61.5 per cent of total accruals.

**IDAHO, MINIDOKA PROJECT**

The Minidoka project is located in Minidoka and Cassia Counties, Idaho. Jackson Lake Reservoir is in Teton County, Wyo. The American Falls Reservoir is in Power, Bingham, and Bannock Counties, Idaho. The irrigation season is from April 1 to October 15 (198 days); average rainfall for 20 years, 11.82 inches; average of maximum and minimum temperatures for the past 20 years, 99.35° and -14.25° F. The principal products are alfalfa, wheat, oats, barley, small seeds, potatoes, livestock, poultry, and dairy commodities.

*Operation and settlement data, Minidoka project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	121,557	121,562	121,570	121,574	121,574
Acreage irrigated.....	107,230	105,580	104,470	99,205	102,351
Miles of canal operated.....	634.60	634.60	634.60	634.60	634
Water diverted (acre-feet).....	697,815	711,050	703,889	633,320	831,288
Water delivered to land (acre-feet).....	<sup>1</sup> 99,363	<sup>1</sup> 107,573	<sup>1</sup> 112,380	<sup>1</sup> 107,653	<sup>1</sup> 126,518
Per acre of land irrigated (acre-feet) <sup>2</sup> .....	<sup>1</sup> 2.13	<sup>1</sup> 2.38	<sup>1</sup> 2.49	<sup>1</sup> 2.48	<sup>1</sup> 2.81
Total number of farms on project.....	2,454	2,451	2,453	2,453	2,465
Population.....	8,848	8,301	7,571	7,197	7,227
Number of irrigated farms.....	2,454	2,451	2,382	2,288	2,286
Operated by owners.....	1,987	1,868	1,758	1,278	1,234
Operated by tenants.....	467	583	624	1,010	1,052
Population.....	8,848	8,301	7,571	7,197	7,227
Number of towns.....	6	6	6	6	6
Population.....	8,445	8,170	7,070	6,920	7,070
Total population, towns and farms.....	17,293	16,471	14,641	14,117	14,297
Number of public schools.....	22	22	22	23	23
Number of churches.....	29	29	29	30	33
Number of banks.....	<sup>3</sup> 6	<sup>3</sup> 5	<sup>3</sup> 4	<sup>3</sup> 5	<sup>3</sup> 5
Total capital stock.....	<sup>3</sup> \$190,000	<sup>3</sup> \$180,000	<sup>3</sup> \$210,000	\$200,000	\$200,000
Amount of deposits.....	<sup>3</sup> \$1,140,000	<sup>3</sup> \$1,100,000	<sup>3</sup> \$1,250,000	\$1,400,000	\$1,398,000
Number of depositors.....	5,900	5,000	6,000	4,000	4,000

<sup>1</sup> South side pumping division only; data from gravity division not available.<sup>2</sup> Partially estimated.<sup>3</sup> Exclusive of banks that failed.*Appropriations*

Fiscal year 1926:	
Congressional authorizations.....	\$205,000.00
Disbursements.....	\$142,054.56
Liabilities, outstanding.....	22,274.90
	164,329.46
Unencumbered balance, June 30, 1926.....	40,670.54
Fiscal year 1927: Amount specified in appropriation acts.....	370,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$9,016,440.78	\$15,550.90	\$119,746.94	\$9,151,738.62
Less collections.....	6,119,712.40			6,119,712.40
Net investment, June 30, 1926.....	2,896,728.38	15,550.90	119,746.94	3,032,026.22

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$13,279.76	\$5,659,533.29
Supplemental construction.....		749,429.74
Value of works taken over.....		211,782.66
Total construction cost.....	13,279.76	\$6,620,745.69
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 625.96	154,421.34
Operation and maintenance deficits and arrearages to be repaid with construction.....		20,630.12
		6,795,797.15
Less:		
Contributed funds.....		799,250.96
Construction revenues.....	55,787.63	687,825.94
Total to be repaid by water users.....	43,133.83	5,308,720.35
Contracted repayments; water right contracts:		
Individuals.....	4,329.22	5,611,838.12
Warren Act.....		429,412.50
Total.....	4,329.22	6,041,250.62

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$115,612.81	\$1,779,181.91	\$102,696.96	\$1,824,163.34
Operation and maintenance returns:				
Contracted.....	117,799.29	1,737,215.59	125,941.80	1,765,015.25
Penalties.....	841.37	28,196.04	1,409.82	29,169.11
Discounts (contra).....	2,107.55	22,287.04	1,775.25	22,341.74
Miscellaneous revenues.....	200.00	98,897.81	464.36	99,161.67
Subtotal.....	116,733.11	1,842,021.90	126,040.73	1,871,004.29
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	8,316.26	20,630.12		20,630.12
Total.....	125,049.37	1,862,652.02	126,040.73	1,891,634.41
Results: Excess.....	9,436.56	83,470.11	23,343.77	67,469.07

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$337,429.76	\$3,050,144.52	\$265,212.80	\$2,236,940.11	\$2.30	\$154,436.61	\$658,767.80
Contributed funds.....		799,250.96		799,250.96			
Total.....	337,429.76	3,849,395.48	265,212.80	3,036,191.07	2.30	154,436.61	658,767.80
Charges paid in advance.....			1,741.48	312.55			
Refunds.....			1,179.24	4,342.96			
Operation and maintenance:							
Water-right charges, project lands (48,172.05) acres.....	98,142.14	1,051,313.54	48,498.70	747,709.75	1,775.25	21,596.94	282,006.85
Warren Act lands (626,840 acres).....	16,148.74	162,282.87	16,046.69	159,479.12		2,697.48	106.27
Irrigation districts (72,593.01 acres).....	21,528.73	541,541.05	31,406.54	490,169.11		51,371.94	
Total.....	135,819.61	1,755,137.46	95,951.93	1,397,357.98	1,775.25	75,666.36	282,113.12
Penalties and interest.....	1,409.82	29,169.11	1,409.82	29,065.50		103.61	
Charges paid in advance.....			4,458.17	6,123.42			
Refunds.....			1,126.62	9,825.83			
Miscellaneous:							
Rentals of irrigation water.....	1,090.32	273,698.30	1,090.32	270,464.07		3,234.23	
Rentals of power and light.....	93,441.45	1,000,732.11	104,467.56	980,777.30	2,333.95	9,608.11	10,346.70
Rentals, grazing and farming lands.....	401.09	35,539.94	441.11	31,475.10			4,064.84
Construction forfeitures.....			100.80	9,748.78			
Penalties and interest:							
Construction.....			20,620.09	83,718.31			
Operation and maintenance.....			597.47	597.47			
Miscellaneous.....				3,420.56			
Other.....			18,090.76	256,291.50			1,803.35
Grand total collections.....			513,005.21	6,119,712.40			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 21.6 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 16.1 per cent of total accruals.

## AMERICAN FALLS RESERVOIR

## Appropriations

<b>Fiscal year 1926:</b>		
Congressional authorizations.....		\$2,867,688.18
Disbursements.....	\$1,859,975.05	
Liabilities outstanding.....	725,758.87	
		<u>2,585,731.92</u>
Unincumbered balance, June 30, 1926.....		281,956.26
<b>Fiscal year 1927:</b> Amount specified in appropriation acts.....		1,635,000.00

## Voucher transactions

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$6,242,844.24	\$4,495.80	\$6,247,340.04
Less collections.....	3,710,630.44		3,710,630.44
Net investment, June 30, 1926.....	2,532,213.80	4,495.80	2,536,709.60

## Construction account

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$2,375,626.79	\$6,153,068.81
Less:		
Contributed funds.....	1,265.75	1,265.75
Construction revenues.....	135,873.74	155,440.29
Total to be repaid by water users.....	2,238,487.30	6,207,263.35
Contracted repayments: Water-right contracts (Warren Act).....	157,307.50	3,190,330.50

<sup>1</sup> Contra.

## Status of current accounts receivable as of June 30, 1926

	Due		Collected (cash)		Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
<b>Construction:</b>					
Water-right charges.....	\$919,406.98	\$2,958,698.23	\$1,358,789.73	\$2,929,017.64	\$29,680.59
Contributed funds.....	1,265.75	1,265.75	1,265.75	1,265.75	
Total.....	920,672.73	2,959,963.98	1,360,055.48	2,930,283.39	29,680.59
<b>Miscellaneous:</b>					
Charges paid in advance.....			1,601,236.49	300,902.33	
Construction penalties and interest.....	279.62	105,854.52	34,244.83	105,854.52	
Construction forfeitures.....			110,902.00	1,880.00	
Other.....			204,801.60	371,710.20	2,781.28
Grand total collections.....			986,973.42	3,710,630.44	

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-rights charges as of June 30, 1926, 1.03 per cent of total accruals.

## MONTANA, HUNTLEY PROJECT

The Huntley project is located in the south central part of Montana, Yellowstone County. The soils consist of heavy clays and light sandy loams, lying at an average elevation of about 3,000 feet above sea level. The average annual rainfall is 12 to 13 inches.



*Operation and settlement data, Huntley project*

Item	1921	1922	1923	1924	1925
Acreages for which bureau was prepared to deliver water.....	31,964	32,000	32,000	32,540	32,540
Acres irrigated.....	18,800	19,523	18,780	19,800	18,939
Miles of canal operated.....	229	229	229	229	229
Water diverted (acre-feet).....	79,188	72,245	72,893	72,893	100,454
Water delivered to land (acre-feet).....	26,814	18,768	20,296	24,717	28,455
Per acre of land irrigated (acre-feet).....	1.42	0.96	1.01	1.26	1.50
Total number of farms on project.....	691	690	596	617	617
Number of irrigated farms.....	578	590	547	557	575
Operated by owners or managers.....	377	387	299	215	260
Operated by tenants.....	201	203	278	342	315
Population.....	1,861	1,682	1,015	1,822	1,866
Number of towns.....	8	8	8	8	8
Population.....	673	673	530	530	570
Total population in towns and on farms.....	2,534	2,355	1,545	2,352	2,436
Number of public schools.....	8	8	8	8	8
Number of churches.....	7	7	9	9	9
Number of banks.....	4	2	2	2	2
Total capital stock.....	\$95,000	\$50,000	\$50,000	\$50,000	\$50,000
Amount of deposits.....	\$402,282	\$166,000	\$155,000	\$192,180	\$163,344
Number of depositors.....	1,475	810	800	750	750

*Appropriations*

<b>Fiscal year 1926:</b>		
Congressional authorizations.....		\$118,000.00
Disbursements.....	\$28,704.31	
Liabilities outstanding.....	4,716.66	
		<b>33,420.97</b>
Unencumbered balance June 30, 1926.....		84,579.03
<b>Fiscal year 1927: Amount specified in appropriations acts.....</b>		<b>96,000.00</b>

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,483,219.50	\$31,698.25	\$2,514,917.75
Less collections.....	952,937.26		952,937.26
Net investment June 30, 1926.....	1,530,282.24	31,698.25	1,561,980.49

*Construction account*

	Fiscal year 1926	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction.....	<sup>1</sup> \$268.00	\$1,124,762.67
Supplemental construction.....		373,736.06
Total construction cost.....	<sup>1</sup> 268.00	1,498,498.72
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 190.75	<sup>1</sup> 1,000.65
Operation and maintenance deficits and arrearages to be repaid with construction.....		10,980.90
		<b>\$1,508,478.97</b>
<b>Less:</b>		
Contributed funds.....		717.64
Construction revenues.....	529.44	17,029.90
		<b>17,747.54</b>
Total to be repaid by water users.....	<sup>1</sup> 988.19	1,490,731.43
Contracted repayments; water-right contracts (individuals)....	5,746.75	1,346,195.46

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
<b>Operation and maintenance cost</b> .....	\$35, 113. 51	\$946, 615. 50	\$38, 305. 57	\$965, 624. 75
<b>Operation and maintenance returns:</b>				
Contracted.....	35, 347. 71	526, 376. 86	36, 051. 82	526, 376. 86
Penalties.....	1, 656. 37	12, 574. 22	2, 294. 98	14, 289. 24
Discounts (contra).....	1, 080. 45	9, 788. 32	1, 070. 70	9, 808. 64
Miscellaneous revenues.....	1, 127. 40	10, 056. 96	968. 90	10, 449. 17
Subtotal.....	37, 050. 73	539, 219. 72	38, 275. 00	541, 306. 63
<b>Other credits: Operation and maintenance deficits and arrearages to be repaid with construction</b> .....		10, 980. 90		10, 980. 90
<b>Total</b> .....	37, 050. 73	550, 200. 62	38, 275. 00	552, 287. 53
<b>Results:</b>				
Excess.....	1, 937. 22			
Deficit.....		396, 414. 88	30. 57	413, 337. 22

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected, June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$33, 333. 67	\$481, 641. 57	\$28, 446. 55	\$423, 694. 09		\$502. 21	\$57, 445. 27
Contributed funds.....		717. 64		717. 64			
Total.....	33, 333. 67	482, 359. 21	28, 446. 55	424, 411. 73		502. 21	57, 445. 27
Charges paid in advance.....			37. 04	373. 43			
Refunds.....				969. 75			
Operation and maintenance:							
Water-right charges, project lands (28,192.06 acres).....	36, 051. 82	526, 376. 86	35, 693. 54	418, 077. 72	\$1, 070. 70	10, 551. 83	97, 747. 31
Penalties and interest.....	2, 294. 98	14, 289. 24	2, 294. 98	14, 113. 47		175. 77	
Charges paid in advance.....			1 521. 15	281. 34			
Refunds.....				96. 97			
Miscellaneous:							
Rentals of irrigation water.....	842. 09	8, 619. 54	1, 206. 29	8, 583. 88			35. 66
Rentals of grazing and farming lands.....	1, 142. 32	14, 770. 10	1, 174. 87	14, 320. 93			449. 17
Construction forfeitures.....			757. 08	10, 931. 93			
Construction penalties and interest.....	1, 904. 59	7, 413. 32	1, 904. 59	7, 413. 32			
Other.....			1, 357. 37	53, 362. 79			20. 00
Grand total collections.....			72, 351. 16	952, 937. 26			

1 Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 11.9 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 13.6 per cent of total accruals.

**MONTANA, MILK RIVER PROJECT**

The Milk River project is located on the Great Northern Railway in north-eastern Montana, about 50 miles south of the Canadian boundary and extending from the mouth of the Milk River (which is about 120 miles west of the North Dakota line) westward for about 150 miles to and beyond Chinook. The average elevation is about 2,200 feet; the soil grades from loam through finer textured loam or clay to a soil known locally as gumbo. The average annual rainfall is about 13.51 inches; the ordinary maximum summer and minimum winter temperatures are about 100° and -40° F., respectively.

*Operation and settlement data, Milk River project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau is prepared to supply water:					
Malta and Glasgow divisions	66,373	66,500	<sup>1</sup> 64,800	64,800	64,790
Chinook division	27,727	30,000	32,500	43,000	43,520
Acreage irrigated	42,400	<sup>2</sup> 46,370	<sup>3</sup> 41,900	<sup>4</sup> 40,500	<sup>5</sup> 49,593
Miles of canal operated, exclusive Chinook division	276	284	282	312	312
Water diverted (acre-feet):					
For Malta and Glasgow divisions	54,444	75,177	67,200	80,000	98,118
For Chinook division	33,335	27,655	34,000	43,000	38,820
Water delivered to land exclusive of Chinook division (acre-feet)	6,190	6,068	6,875	7,800	11,392
Per acre of land irrigated, exclusive of Chinook division (acre-feet)	0.54	0.51	0.50	0.61	0.57
Number of farms on project	<sup>6</sup> 364	<sup>7</sup> 298	680	657	691
Population	816	1,057	1,839	1,968	2,000
Number of irrigated farms	178	209	211	171	251
Operated by owners or managers	134	130	146	92	149
Operated by tenants	44	79	65	79	102
Population	784	651	50	643	936
Total population of farms and towns	<sup>8</sup> 7,986	<sup>9</sup> 8,137	<sup>10</sup> 9,514	<sup>11</sup> 8,993	<sup>12</sup> 10,108
Number of towns	15	15	15	15	15
Population of towns	7,170	7,100	7,675	7,025	8,108
Total number of schools on project	38	38	35	24	21
Number of churches	25	25	30	35	35
Number of banks	24	23	20	17	13
Total capital stock	\$825,000	\$843,000	\$709,500	\$675,000	\$490,000
Deposits	\$3,362,000	\$4,350,000	\$3,736,000	\$5,036,000	\$4,761,300
Depositors	12,500	12,000	9,900	10,300	9,500

<sup>1</sup> Reduction due to better data on irrigable area.<sup>2</sup> Includes irrigated area in the Chinook division and land in the Malta and Glasgow divisions irrigated wholly or in part from floodwater systems.<sup>3</sup> Total number of farms reported on crop census.<sup>4</sup> Exclusive of Chinook division.<sup>5</sup> Includes Chinook division.*Appropriations*

Fiscal year 1926:

Congressional authorizations	\$76,000.00
Disbursements	\$53,024.38
Liabilities outstanding	10,574.29
	63,600.67

Unencumbered balance, June 30, 1926 12,399.33 |Fiscal year 1927: Amount specified in appropriation acts 72,000.00 |*Voucher transactions*

	Reclamation fund	Judgments of Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers	\$7,471,261.22	\$2,674.64	\$98,095.17	\$7,572,031.03
Less collections	441,010.54			441,010.54
Net investment, June 30, 1926	7,030,250.68	2,674.64	98,095.17	7,131,020.49

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction	\$62,112.05	\$6,742,873.04
Operation and maintenance prior to public notice (net)	43,356.89	467,037.48
		\$7,209,910.52
Less construction revenues	2,871.28	66,092.16
Total to be repaid by water users	102,597.66	7,143,818.36

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Charges paid in advance.....				\$1, 114. 00			
Miscellaneous:							
Rentals of irrigation water....	\$19, 109. 32	\$229, 195. 21	\$20, 011. 54	211, 385. 89	\$19. 62	\$1, 194. 40	\$16, 614. 92
Rentals of grazing and farming lands.....	4, 352. 91	39, 081. 14	4, 357. 91	38, 662. 49		38. 88	379. 77
Other.....			1, 449. 16	189, 548. 16			470. 25
Grand total collections....			25, 818. 61	441, 010. 54			

**MONTANA, SUN RIVER PROJECT**

The Sun River project is located in Cascade, Chouteau, Lewis and Clark, and Teton Counties, lying to the north and west of Great Falls, Mont. The average elevation of the irrigable area is about 3,700 feet above sea level; the soil is loam, clay, and alluvium. The average annual rainfall is 10.9 inches; and the average annual temperatures are: Maximum, 96°; minimum, -34°; mean, 45° F. The length of the irrigation season is from May 1 to October 10 (163 days); the principal crops are hay, grain, vegetables, livestock, and dairy products. The project is served by lines of the Great Northern, and the Chicago, Milwaukee & St. Paul Railways. The principal markets are Great Falls, St. Paul, Minneapolis, Chicago, and Seattle.

The Fort Shaw division is watered by a canal system taking water from Sun River. For the irrigation of lands north of Sun River, water is diverted from the north fork of Sun River and is carried through Fishkun, Sun River Slope, and Greenfields Canals to the irrigable lands. The distributing system has been built for the irrigation of 41,975 acres.

*Operation and settlement data, Fort Shaw and Greenfields divisions, Sun River project*

Item	1921	1922	1923	1924	1925
Acres for which bureau was prepared to supply water.....	40, 067	42, 465	42, 470	57, 160	55, 877
Acres irrigated.....	21, 750	20, 537	9, 090	21, 630	20, 468
Miles of canal operated.....	267	267	267	386	384
Water diverted (acre-feet).....	88, 258	64, 683	44, 709	80, 089	78, 707
Water delivered to land (acre-feet).....	30, 300	24, 200	13, 208	31, 145	26, 538
Per acre of land irrigated (acre-feet).....	1. 39	1. 17	1. 31	1. 44	1. 29
Total number of farms on project.....	500	500	500	763	763
Population.....	1, 000	1, 000	1, 000	1, 112	1, 007
Number of irrigated farms.....	373	388	294	441	416
Operated by owners or managers.....	285	273	200	266	224
Operated by tenants.....	88	115	94	175	192
Population.....	949	978	817	1, 059	1, 001
Number of towns.....	4	4	4	4	4
Population.....	378	401	354	397	369
Total population in towns and on farms.....	1, 378	1, 401	1, 354	1, 509	1, 466
Number of public schools.....	17	17	17	17	17
Number of churches.....	11	11	11	11	11
Number of banks.....	3	3	3	3	2
Total capital stock.....	\$65, 000	\$71, 500	\$65, 000	\$66, 400	\$50, 000
Amount of deposits.....	\$150, 000	\$158, 000	\$212, 000	\$147, 000	\$125, 000
Number of depositors.....	780	740	650	585	700

*Appropriations*

Fiscal year 1926:		
Congressional authorization.....		\$511,025.70
Disbursements.....	\$48,635.62	
Liabilities outstanding.....	5,254.12	
		53,890.74
Unencumbered balance June 30, 1926.....		557,135.96
Fiscal year 1927: Amount specified in appropriation acts.....		159,000.00

<sup>1</sup> Plus unexpended balance of 1926 appropriation.

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,910,060.32	\$1,585.35	\$69,158.93	\$4,980,804.60
Less collections.....	559,845.15			559,845.15
Net investment June 30, 1926.....	4,350,215.17	1,585.35	69,158.93	4,420,959.45

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$18,846.18	\$4,407,615.96
Operation and maintenance prior to public notice (net).....	9,071.77	140,385.33
Operation and maintenance deficits and arrearages to be repaid with construction.....		16,373.99
		\$4,564,375.28
Less:		
Contributed funds.....	25.70	300.39
Construction revenues.....	1,365.13	40,440.06
		40,740.45
Total to be repaid by water users.....	26,527.12	4,523,634.83
Contracted repayments: Water-right contracts (individuals).....	<sup>1</sup> 5,458.80	416,964.33

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$12,013.58	\$230,134.25	\$11,676.49	\$237,289.15
Operation and maintenance returns:				
Contracted.....	11,403.14	181,822.00	11,023.00	181,442.46
Penalties.....	2,311.11	5,780.39	1,030.90	6,464.01
Discounts (contra).....	207.90	3,400.14	214.62	3,432.32
Miscellaneous revenues.....	314.15	2,793.49	304.29	2,808.91
Subtotal.....	13,820.50	186,996.74	12,148.57	187,283.06
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		16,373.99		16,373.99
Total.....	13,820.50	203,369.73	12,148.57	203,657.05
Results:				
Excess.....	1,806.92		472.06	
Deficit.....		26,764.52		33,632.10

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30 1926
			Cash		Other credits		
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
<b>Construction:</b>							
Water-right charges.....	\$15,015.10	\$195,345.44	\$9,485.20	\$165,580.74	\$54.21	\$479.30	\$29,285.40
Contributed funds.....	25.70	300.39	25.70	184.47			115.92
Total.....	15,040.80	195,645.83	9,510.90	165,765.21	54.21	479.30	29,401.32
Charges paid in advance.....			10.55	29,186.61			
Refunds.....				3,034.70			
<b>Operation and maintenance:</b>							
Water-right charges, project lands (13,902.01 acres).....	11,028.00	181,442.46	8,739.87	148,526.47	340.59	3,834.10	29,081.89
Penalties and interest.....	1,030.90	6,464.01	798.85	5,839.78	41.50	165.88	458.35
Charges paid in advance.....			10.55				
Refunds.....				126.91			
<b>Miscellaneous:</b>							
Rentals of irrigation water.....	16,862.38	88,701.12	20,533.99	63,292.54	148.24	1,069.54	24,339.04
Rentals, grazing and farm- ing lands.....	5,327.01	42,756.11	5,489.28	39,822.96			2,933.15
Construction forfeitures.....			128.88	4,731.93			
Construction penalties and interest.....	1,731.75	6,021.55	1,437.04	5,546.12	.91	13.12	462.31
Other.....			3,503.40	93,971.92			939.17
Grand total collections.....			50,142.21	559,845.15			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 15 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1926, 16 per cent of total accruals.

**MONTANA-NORTH DAKOTA, LOWER YELLOWSTONE PROJECT**

The Lower Yellowstone project is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. The length of the irrigation season depends upon the amount of precipitation in the spring. May 1 to October 10 (163 days) is the maximum period of water deliveries. The average elevation is 1,900 feet above sea level. The average number of days between the last killing frost in the spring and the first in the fall is 129. Since 1905 the average annual rainfall has been about 14.4 inches. The average of the highest temperature is 103° F., and the average lowest —35° F. Some alkali and gumbo are found in scattered low tracts, but the project as a whole has a deep sandy loam soil. The principal crops are alfalfa, grain, sugar beets, seed peas, potatoes, and corn. The principal markets are Sidney, Mont., for sugar beets; Duluth, Minneapolis, and local mills for grain; St. Paul, Minn., Chicago, Ill., and Seattle, Wash., for livestock. Alfalfa, corn, oats, and barley are largely consumed locally.

*Operation and settlement data, Lower Yellowstone project*

Item	1921	1922	1923	1924	1925
Acreage for which the bureau was prepared to supply water.....	1 40,344	1 40,200	1 58,000	1 58,000	1 58,000
Acreage irrigated.....	19,980	15,599	17,859	14,030	18,276
Miles of canal operated.....	174	213	268	226	262
Water diverted (acre-feet).....	64,972	49,280	89,290	81,070	107,340
Water delivered to land (acre-feet).....	25,733	18,411	22,459	17,757	29,675
Per acre of land irrigated (acre-feet).....	1.28	1.17	1.26	1.26	1.62
Total number of farms on project.....	572	575	686	686	722
Population.....	1,390	1,591	1,265	1,567	1,411
Number of irrigated farms.....	370	370	373	390	438
Irrigated farms operated by owners and managers.....	223	236	231	235	200
Irrigated farms operated by tenants.....	147	134	142	155	238
Number of towns.....	8	8	8	8	6
Population.....	2,805	2,805	2,415	2,560	2,050
Total population in towns and farms.....	4,195	4,396	3,680	4,127	4,461
Number of public schools.....	12	13	13	16	14
Number of churches.....	15	15	15	15	15
Number of banks.....	9	7	4	6	5
Total capital stock.....	\$335,000	\$200,000	\$100,000	\$150,000	\$127,500
Amount of deposits.....	\$1,851,000	\$1,425,000	\$308,645	\$880,120	\$865,000
Number of depositors.....	4,726	4,476	1,850	2,778	3,170

<sup>1</sup> District lands only.*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$180,000.00
Disbursements.....		\$51,280.85
Liabilities outstanding.....		5,760.44
		57,041.29
Unencumbered balance June 30, 1926.....		122,949.71
Fiscal year 1927: Amount specified in appropriation acts.....		137,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,211,969.84	\$40,119.25	\$30,908.55	\$4,282,997.64
Less collections.....	428,756.79			428,756.79
Net investment June 30, 1926.....	3,783,213.05	40,119.25	30,908.55	3,854,240.85

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....		\$3,089,220.39
Supplemental construction.....		77,306.38
Total construction cost.....		3,166,526.77
Operation and maintenance prior to public notice (net).....	1 9982.02	1 1,536.20
Operation and maintenance deficits and arrearages to be repaid with construction.....		522,500.05
		\$3,687,490.02
Less construction revenues.....	993.97	46,776.22
Total to be repaid by water users.....	1 1,975.99	3,640,714.40
Contracted repayments:		
Contracts, Lower Yellowstone irrigation districts Nos. 1 and 2.....	1 135.50	3,588,285.91
Water-right contracts (special).....		25,880.40
Total.....		3,614,166.31

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
<b>Operation and maintenance cost</b> .....	\$66,566.58	\$1,037,401.59	\$56,183.26	\$1,069,745.06
<b>Operation and maintenance returns:</b>				
Contracted.....	65,783.56	389,123.86	65,783.56	389,123.86
Penalties.....		2.59		2.59
Discounts (contra).....		4.63		4.63
Miscellaneous revenues.....	783.02	125,779.72	950.68	126,044.88
Subtotal.....	66,566.58	514,901.54	66,734.24	515,166.70
<b>Other credits: Operation and maintenance deficits and arrearages to be repaid with construction</b> .....		522,500.05		522,500.05
<b>Total</b> .....	66,566.58	1,037,401.59	66,734.24	1,037,666.75
<b>Results:</b>				
Excess.....			10,550.98	
Deficit.....				32,078.31

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction: Water-right charges.....	\$32,648.96	\$134,706.92	\$19,286.13	\$70,149.45			\$64,557.47
Operation and maintenance:							
Water-right charges, irriga- tion districts (58,248 acres).....	52,427.20	343,693.79	42,673.45	95,407.17		\$4.63	248,281.99
Penalties and interest.....		2.59		2.59			
Refunds.....				190.56			
Miscellaneous:							
Rentals of irrigation water.....	151.70	124,002.19	1,540.53	123,986.26			15.98
Rentals of farming and graz- ing lands.....	290.00	3,567.63	217.70	3,495.33			72.30
Penalties and interest—							
Construction.....	5,622.16	5,637.04	5,622.16	5,637.04			
Operation and mainte- nance.....	11,188.89	49,752.72	11,188.89	49,752.72			
Miscellaneous.....	218.40	218.40	218.40	218.40			
Other.....			5,504.58	79,917.27			17.75
Grand total collections.....			86,251.84	428,756.79			

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 47.9 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1926, 72.3 per cent of total accruals.

**NEBRASKA-WYOMING, NORTH PLATTE PROJECT**

The North Platte project is situated in western Nebraska and eastern Wyoming. The character of the soil varies from sandy loam on the major portion of the Interstate and Northport divisions to gumbo soil on portions of the Fort Laramie division. The principal products are alfalfa, cereals, corn, sugar beets, and potatoes; and the principal markets are Omaha, Nebr., Kansas City and St. Joseph, Mo., Denver, Colo., and central Wyoming. The length of the irrigation season is from April 1 to September 30 and the average rainfall amounts to 14.67 inches. The average temperature ranges between 99° maximum and -21° minimum, F.



*Operation and settlement data, Interstate division, North Platte project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	<sup>1</sup> 129,666	113,436	113,490	114,633	113,716
Acreage irrigated.....	<sup>1</sup> 97,400	87,300	87,404	81,888	84,116
Miles of canal operated.....	809	805	802	810	810
Water delivered to land (acre-feet).....	<sup>1</sup> 186,328	222,509	155,600	262,245	221,458
Per acre of land irrigated (acre-feet).....	<sup>1</sup> 2.14	2.55	1.78	2.72	2.63
Total number of farms on project.....	1,450	1,458	1,458	1,458	1,460
Population.....	5,700	5,300	5,300	5,000	4,500
Number of irrigated farms.....	1,340	1,340	1,307	1,325	1,363
Operated by owners or managers.....	710	720	669	625	581
Operated by tenants.....	630	620	638	700	782
Population.....	5,200	4,782	4,543	4,350	3,997
Number of towns.....	9	9	6	6	6
Population.....	14,400	14,400	12,700	12,700	12,700
Total population of towns and farms.....	20,100	19,700	18,000	17,700	17,200
Number of public schools.....	40	40	50	50	50
Number of churches.....	26	26	37	37	37
Number of banks.....	27	12	13	12	12
Total capital stock.....	\$787,500	\$475,000	\$505,000	\$437,500	\$437,500
Amount of deposits.....	\$6,834,400	\$3,957,700	\$4,533,000	\$5,174,460	\$5,590,000
Number of depositors.....	11,200	11,650	13,300	12,300	14,000

<sup>1</sup> All data exclusive of North Platte Canal & Colonization Co. lands.<sup>2</sup> Includes North Platte Canal & Colonization Co. lands.<sup>3</sup> Exclusive of lands under North Platte Canal & Colonization Co. tract.<sup>4</sup> Statistics for items below, for years previous to 1922, include some figures for Fort Laramie and North-  
port divisions.*Operation and settlement data, Fort Laramie division, North Platte project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	16,232	44,091	55,500	72,000	107,075
Acreage irrigated.....	12,150	20,302	32,441	39,064	69,093
Miles of canal operated.....	138	311	427	539	662
Water delivered to the land (acre-feet).....	22,665	43,689	45,808	98,757	141,878
Per acre of land irrigated (acre-feet).....	1.85	2.15	1.41	2.53	2.06
Total number of farms on project.....	407	573	717	1,334	1,322
Population.....	1,500	1,086	1,700	4,500	4,500
Number of irrigated farms.....	190	320	564	770	979
Operated by owners or managers.....	105	244	259	207	368
Operated by tenants.....	85	76	305	563	611
Population.....	433	650	1,411	1,575	2,601
Number of towns.....	3	11	10	10	10
Population.....	2,900	5,000	4,800	4,800	4,800
Total population of towns and farms.....	4,400	6,086	6,500	9,300	9,300
Number of public schools.....	10	20	38	38	38
Number of churches.....	1	16	18	18	18
Number of banks.....	<sup>1</sup> 8	12	7	5	6
Total capital stock.....	<sup>1</sup> \$185,000	\$285,000	\$165,000	\$95,000	\$120,000
Amount of deposits.....	<sup>1</sup> \$1,039,600	\$1,794,900	\$1,413,000	\$1,000,110	\$1,260,000
Number of depositors.....	5,500	3,600	4,150	4,800	3,150

<sup>1</sup> Data for items below for years previous to 1923 estimated.<sup>2</sup> Lands on the Interstate and Fort Laramie divisions are tributary to 6 of the banks listed above.<sup>3</sup> \$155,000 of this amount is listed under similar caption on Interstate division.<sup>4</sup> \$919,600 of this amount is listed under similar caption on Interstate division.

*Operation and settlement data, Northport division, North Platte project*

Item	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water..	4, 712	16, 350	16, 350	16, 216
Acreage irrigated.....	3, 645	8, 950	9, 169	9, 489
Miles of canal operated.....		100	106	107
Water delivered to the land (acre-feet).....	11, 722	16, 821	30, 535	24, 646
Per acre of land irrigated (acre-feet).....	3. 02	1. 88	3. 33	2. 60
Total number of farms on project.....	232	233	233	233
Population.....	800	406	700	700
Number of irrigated farms.....	50	148	179	167
Operated by owners of managers.....	19	70	57	60
Operated by tenants.....	31	78	122	107
Population.....	250	225	415	380
Number of towns.....	2	2	2	2
Population.....	1, 400	1, 400	1, 400	1, 400
Total population of towns and farms.....	2, 220	1, 806	2, 100	2, 100
Number of public schools.....	7	6	14	14
Number of churches.....	5	5	5	5
Number of banks.....	2	2	2	2
Total capital stock.....	\$50, 000	\$50, 000	\$50, 000	\$50, 000
Amount of deposits.....	\$827, 000	\$843, 600	\$842, 000	\$850, 000
Number of depositors.....	2, 000	2, 480	2, 300	2, 000

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$1, 069, 911. 47
Disbursements.....	\$1, 222, 733. 26	
Liabilities outstanding.....	312, 376. 46	
		1, 535, 109. 72
Unencumbered balance June 30, 1926.....		164, 801. 75
Fiscal year 1927: Amount specified in appropriation acts.....		1, 300, 000. 00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$21, 013, 192. 14	\$26, 425. 67	\$353, 839. 98	\$21, 393, 457. 79
Less collections.....	4, 686, 798. 65			4, 686, 798. 65
Net investment, June 30, 1926.....	16, 326, 393. 49	26, 425. 67	353, 839. 98	16, 706, 659. 14

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$582, 702. 56	\$16, 032, 008. 77
Supplemental construction.....	447, 376. 19	1, 340, 976. 51
Value of works taken over.....		41, 441. 65
Equipment and supplies added to construction cost.....	46, 908. 50	46, 908. 50
Total construction cost.....	1, 076, 987. 25	17, 461, 335. 43
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 3, 756. 49	577, 530. 28
Operation and maintenance deficits and arrearages to be repaid with construction.....		150, 483. 06
		\$18, 189, 348. 79
Less:		
Contributed funds.....	<sup>1</sup> 815. 96	33, 782. 28
Construction revenues.....	127, 361. 48	242, 830. 01
		276, 612. 29
Total to be repaid by water users.....	946, 685. 24	17, 912, 736. 50
Contracted repayments, water-right contracts:		
Individuals.....	11, 550. 00	7, 923, 549. 41
Warren Act.....	<sup>1</sup> 123, 813. 50	950, 200. 00
Irrigation districts.....	38, 973. 25	6, 338, 973. 25
Special.....	84, 840. 25	123, 813. 50
Total.....	11, 550. 00	15, 336, 536. 16

<sup>1</sup> Contra.

## Operation and maintenance account

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$365,143.55	\$2,485,518.04	\$254,578.27	\$2,576,774.78
Operation and maintenance returns:				
Contracted.....	351,411.95	2,437,352.77	254,690.52	2,450,896.67
Penalties.....	194.83	27,036.74	83,378.77	110,296.14
Discounts (contra).....	1,371.13	35,410.41	1,391.51	35,716.07
Miscellaneous revenues.....	1,528.80	25,232.64	1,179.50	26,071.14
Subtotal.....	351,764.45	2,454,241.74	337,847.28	2,561,527.88
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		150,483.08		150,483.08
Total.....	351,764.45	2,604,724.82	337,847.28	2,702,010.96
Results:				
Excess.....		119,206.78	83,269.01	125,236.18
Deficit.....	13,379.10			

## Status of current accounts receivable as of June 30, 1926

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges	\$415,892.39	\$3,542,573.08	\$71,992.40	\$1,859,861.92	\$830.51	\$36,527.78	\$1,646,183.26
Contributed funds	1815.96	33,782.28	1815.96	33,782.28			
Total	415,076.43	3,576,355.36	71,176.44	1,893,644.20	830.51	36,527.78	1,646,183.38
Charges paid in advance			1206.94	322.06			
Refunds			3,457.28	5,196.13			
Operation and maintenance:							
Water-right charges, project lands (109,166.07 acres)	214,564.12	2,040,594.22	37,107.25	1,234,440.51	1,800.78	46,297.42	759,856.29
Special contracts	113,468.87	153,354.74	18,609.45	13,061.55	51.67	270.04	10,023.15
Warren Act lands (127,115, approximate, acres)	9,420.43	87,798.73	4,128.13	76,013.86			11,784.67
Contributed funds	21,180.00	100,483.50	21,180.00	100,483.50			
Irrigation districts (16,350 approximate acres)	22,984.84	68,655.48	23,381.10	46,129.14			22,526.34
Total	254,680.52	2,450,886.67	77,187.03	1,600,128.56	1,852.45	46,567.46	804,190.65
Penalties and interest	83,378.77	110,286.14	1115.50	26,064.13	32.96	700.70	83,461.81
Charges paid in advance			159.59	330.69			
Refunds				488.96			
Miscellaneous:							
Rentals of irrigation water	103,385.19	391,328.44	39,259.14	319,186.54		10.00	72,131.90
Rentals, power and light	98,702.44	251,626.31	70,351.65	199,460.41	24,104.37	44,006.27	8,159.53
Rentals of grazing and farming lands	6,994.90	96,775.60	7,133.80	91,995.63	72.31	72.31	4,707.66
Construction forfeitures				6,102.75			
Penalties and interest—							
Construction	127,817.75	231,414.74	5,872.82	98,604.71	108.39	860.03	131,950.00
Operation and maintenance		2,015.37					
Miscellaneous		7,074.14					
Other			66,841.81	436,184.37			7,083.42
Grand total collections			341,117.12	4,686,798.65			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 46.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 32.8 per cent of total accruals.

## NEVADA, NEWLANDS PROJECT

The Newlands project is located on the Southern Pacific Railroad in Churchill, Storey, Lyon, and Washoe Counties, Nev. The annual average precipitation on the irrigable area, which is at an average elevation of 4,000 feet above sea level, is 4.74 inches. The principal crops are alfalfa, grain, potatoes, cantaloupes, honey, and dairy products.

*Operation and settlement data, Newlands project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water	72,166	73,747	73,730	72,625	64,572
Acreage irrigated	46,160	44,963	44,890	44,280	42,545
Miles of canals operated	393	410	411	411	407
Water diverted (acre-feet)	314,241	499,508	367,929	265,660	499,273
Water delivered to land (acre-feet)	132,788	141,972	145,653	149,560	158,522
Per acre of land irrigated (acre-feet)	2.87	3.15	3.24	3.38	3.72
Total number of farms on project	870	906	912	917	794
Population	2,652	2,450	2,737	2,668	2,549
Number of irrigated farms	788	778	788	762	761
Operated by owners or managers	708	681	681	670	639
Operated by tenants	80	97	107	92	122
Population	2,652	2,450	2,737	2,668	2,549
Number of towns	5	5	5	5	5
Population	2,500	2,500	2,500	2,300	2,400
Total population, towns, and on farms	5,152	4,950	5,237	4,968	4,949
Number of public schools	11	11	11	11	11
Number of churches	8	8	8	9	9
Number of banks	1	1	1	1	1
Capital stock	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
Amount of deposits	\$677,104	\$680,700	\$800,000	\$851,639	\$975,273
Number of depositors	2,000	1,700	1,600	1,700	1,750

*Appropriations*

Fiscal year 1926:	
Congressional authorizations	\$912,000.00
Disbursements	\$124,056.26
Liabilities outstanding	13,055.89
	137,112.15
Unencumbered balance June 30, 1926	774,887.85
Fiscal year 1927: Amount specified in appropriation acts	152,000.00

<sup>1</sup> Plus certain unexpended balances of 1926 appropriations.

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers	\$9,193,499.32	\$90,440.32	\$9,283,939.64
Less collections	2,140,017.07		2,140,017.07
Net investment June 30, 1926	7,053,482.25	90,440.32	7,143,922.57

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$27,667.86	\$6,744,281.04
Supplemental construction.....		753,955.72
Value of works taken over.....		37,082.61
Total construction cost.....	27,667.86	\$7,535,319.37
Operation and maintenance prior to public notice (net).....	<sup>1</sup> 538.37	<sup>1</sup> 2,078.48
Operation and maintenance deficits and arrearages to be repaid with construction.....	12,287.02	16,444.38 14,365.90
Less: Construction revenues.....	10,249.68	7,549,085.27
Total to be repaid by water users.....	29,166.83	185,755.43
Contracted repayments:		7,363,929.79
Water-right contracts (individuals).....	<sup>1</sup> 133,553.67	1,707,473.77
Contract, Truckee-Carson Irrigation District.....		699,305.80
Total.....	<sup>1</sup> 133,553.67	2,406,779.57

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$94,512.47	\$1,379,737.30	\$99,564.50	\$1,431,471.83
Operation and maintenance returns:				
Contracted.....	51,608.29	1,246,314.37	74,245.25	1,242,608.46
Penalties.....	8,668.24	25,230.24	6,964.50	28,178.22
Discounts (contra).....	2,616.74	22,868.22	2,757.17	28,017.23
Miscellaneous revenues.....	5,248.83	24,597.70	1,463.00	25,439.87
Subtotal.....	62,908.62	1,273,274.09	79,915.58	1,273,210.32
Other credits: Operation and maintenance deficit and arrearages to be repaid with construction.....	12,287.02	16,444.38	12,287.02	16,444.38
Total.....	75,195.64	1,289,718.47	92,202.60	1,289,654.70
Results: Deficit.....	19,316.83	90,018.83	7,361.90	141,817.13

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
<b>Construction:</b>							
Water-right charges.....	\$78,910.14	\$716,005.42	\$48,602.10	\$625,676.80	\$1,199.47	\$9,006.29	\$81,323.33
Charges paid in advance.....			\$3,677.84	1,231.21			
Refunds.....				384.55			
<b>Operation and maintenance:</b>							
Water-right charges, project lands (62,396 acres).....	\$87,136.19	\$1,110,431.26	\$117,586.70	\$992,378.12	\$4,448.31	\$6,471.08	\$1,581.46
Penalties and interest.....	6,964.50	28,178.22	6,116.38	26,485.63	95.89	907.62	784.97
Charges paid in advance.....			101.37	395.68			
Refunds.....				111.96			
<b>Miscellaneous:</b>							
Rentals of irrigation water.....	2,001.37	26,399.14	1,980.37	20,198.29		6,176.85	24.00
Rentals, power, and light.....	15,995.65	232,443.96	15,843.53	205,595.95		25,506.75	1,342.26
Rentals, grazing and farming lands.....	2,295.23	37,746.05	4,663.26	36,917.70			823.35
Construction forfeitures.....			8,056.90	16,652.50			
Construction penalties and interest.....	6,790.93	16,502.93	6,250.87	15,946.97			556.96
Other.....			4,781.58	198,041.71			920.87
Grand total collections.....			210,305.22	2,140,017.07			

<sup>1</sup> Actual construction accruals for fiscal year 1926..... \$106,730.13  
Less deductions due to cancellations, relinquishments, and adjustments..... \$20,242.79  
Deferred under sec. 2, act May 9, 1924..... 7,577.20

Net accruals..... 78,910.14

<sup>2</sup> Contra.....  
<sup>3</sup> Actual operation and maintenance accruals for fiscal year 1926..... \$113,068.14  
Less deduction due to cancellations, relinquishments, and adjustments..... \$13,003.23  
Deferred and transferred to construction under sec. 2, act May 9, 1924..... 12,928.72

Net accruals..... 87,136.19

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 11.4 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1926, 7.3 per cent of total accruals.

**NEW MEXICO, CARLSBAD PROJECT**

The Carlsbad project is located in Eddy County, N. Mex. The length of the irrigation season is 260 days, which includes two weeks in winter. The average elevation of the irrigable area is 3,100 feet. The rainfall averages 14.2 inches. The average of recorded temperatures for a period of 23 years ranges from 112° to -7° F. The soil of the irrigable area is Pecos clay and sandy loam, with high lime content. The principal products are cotton, alfalfa, and miscellaneous grains and fruits. The principal markets are Carlsbad, Kansas City, Chicago, New Orleans, and Galveston.

*Operation and settlement data, Carlsbad project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	25,000	25,000	25,000	25,045	25,045
Acreage irrigated.....	23,810	24,076	24,080	24,480	24,778
Miles of canal operated.....	45	45	45	45	45
Water diverted (acre-feet).....	137,500	116,700	120,200	133,300	164,800
Water delivered to land (acre-feet).....	59,371	56,687	57,256	66,384	45,380
Per acre of land irrigated (acre-feet).....	2.49	2.36	2.38	2.71	1.84
Total number of farms on project.....	1,769	1,796	1,808	1,824	1,817
Population.....	1,435	1,580	2,128	2,080	2,041
Number of irrigated farms.....	426	333	388	412	392
Operated by owners or managers.....	277	184	188	169	116
Operated by tenants.....	149	149	200	243	415
Population.....	1,435	1,580	2,128	2,080	2,041
Number of towns.....	4	4	4	4	4
Population.....	3,375	3,440	3,440	3,440	3,575
Total population in towns and on farms.....	4,810	5,020	4,568	5,500	5,616
Number of public schools.....	13	10	12	12	8
Number of churches.....	11	12	12	12	12
Number of banks.....	3	3	1	2	2
Total capital stock.....	\$225,000	\$225,000	\$25,000	\$85,000	\$101,700
Amount of deposits.....	\$1,176,441	\$1,106,300	\$100,000	\$325,000	\$382,500
Number of depositors.....	2,350	2,374	4300	1,350	1,750

<sup>1</sup> Water-right applications; decrease due to consolidation.

<sup>2</sup> Many farms were operated by one man.

<sup>3</sup> Several tenants on one farm, also operated in part by owner.

<sup>4</sup> Two bank failures Jan. 2 and May 10, 1924.

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$70,000.00
Disbursements.....		\$64,702.86
Liabilities outstanding.....		2,188.24
		66,891.10
Unencumbered balance June 30, 1926.....		3,108.90
Fiscal year 1927: Amount specified in appropriation acts.....		50,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Courts of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,078,164.21	\$19,830.29	\$20,984.02	\$2,127,978.52
Less collections.....	1,291,445.53			1,291,445.53
Net investment June 30, 1926.....	786,718.68	19,830.29	20,984.02	836,532.99

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$20,330.85	\$1,458,995.57
Operation and maintenance prior to public notice (net).....	1,547.69	15,172.10
Operation and maintenance arrearages to be repaid with construction.....		1,034.00
		\$1,445,757.47
Less:		
Contributed funds.....		7,980.06
Construction revenues.....	1,006.91	17,055.22
		25,035.28
Total to be repaid by water users.....	17,777.25	1,420,722.19
Contracted repayments: Water-right contracts (individuals).....	870.00	1,423,192.75

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1926	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$46,177.99	\$602,723.62	\$48,364.17	\$628,084.30
Operation and maintenance returns:				
Contracted.....	37,991.88	591,460.32	38,021.88	591,490.32
Penalties.....	1,436.13	24,975.03	606.85	25,419.02
Discounts (contra).....	1,244.61	10,421.91	1,309.30	10,928.68
Miscellaneous revenues.....	1,640.08	16,978.11	1,796.07	18,404.16
Subtotal.....	39,833.48	622,991.55	39,115.50	624,384.82
Other credits: Operation and maintenance arrear- ages to be repaid with construction.....		1,934.00		1,934.00
Total.....	39,833.48	624,925.55	39,115.50	626,318.82
Results:				
Deficit.....	6,344.51		9,248.67	1,765.48
Excess.....		22,201.98		

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges .....	\$60,783.87	\$594,318.43	\$48,191.64	\$567,719.39	\$81.25	\$81.25	\$26,517.79
Contributed funds .....		7,980.06		7,980.06			
Total .....	60,783.87	602,298.49	48,191.64	575,699.45	81.25	81.25	26,517.79
Charges paid in advance .....			131.52	333.69			
Operation and maintenance:							
Water-right charges, project lands (25,055 acres) .....	38,021.88	591,490.32	36,255.86	569,000.76	1,309.30	10,928.68	11,560.88
Penalties and interest .....	606.85	25,419.02	606.85	25,419.02			
Miscellaneous:							
Rentals of irrigation water .....	2,980.37	29,077.42	2,980.37	29,077.42			
Rentals of grazing lands .....	674.03	14,316.45	762.03	13,755.45			561.00
Construction forfeitures .....		269.70		269.70			
Construction penalties and interest .....	1,910.88	29,558.06	1,910.88	29,558.06			
Other .....			2,383.64	48,331.98			90.57
Grand total collections .....			92,959.75	1,291,445.53			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 4.46 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 1.96 per cent of total accruals.

**NEW MEXICO-TEXAS, RIO GRANDE PROJECT**

The Rio Grande project is international as well as interstate, having an irrigable area of 155,000 acres in New Mexico and Texas, and supplying water under treaty to approximately 25,000 acres in the Republic of Mexico. Water is also supplied by Warren Act contract to an irrigation district of 16,000 additional acres below the project. The irrigable area consists of the alluvial valley floor of the Rio Grande, ranging from 2 to 6 miles wide and 150 miles long. The water supply is obtained and controlled by storage of the flood waters of the Rio Grande in Elephant Butte Reservoir. The irrigation season normally is from February 1 to October 15, with short winter runs. The average annual rainfall is 10 inches. The elevation of the irrigable area is 3,500 to 4,200 feet. The mild, even climate permits year round outdoor work and crops. The principal crops are cotton, alfalfa, corn, cane, melons, truck, and pears. Excellent opportunities and favorable conditions exist for intensive diversified farming. El Paso, Tex., a thriving city of 100,000 population, is located near the center of the project. Main line railroads radiate from El Paso in eight lines furnishing excellent trade and



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marketing facilities. The project is practically all in private ownership and is now approximately 90 per cent under cultivation.

## Operation and settlement data, Rio Grande project

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water	109,000	116,000	124,000	142,000	148,000
Acreage irrigated	<sup>1</sup> 85,580	<sup>2</sup> 89,589	<sup>3</sup> 92,220	<sup>4</sup> 116,000	<sup>5</sup> 131,000
Miles canal and drain operated	586	645	808	926	950
Water diverted (acre-feet)	<sup>6</sup> 782,366	<sup>6</sup> 968,728	<sup>6</sup> 1,036,419	1,360,380	1,248,731
Water delivered to land (acre-feet)	<sup>7</sup> 197,086	204,452	188,819	240,000	282,654
Per acre of land irrigated (acre-feet)	2.55	2.28	2.18	2.18	2.16
Total number of farms on project	3,204	3,534	3,743	4,119	4,442
Population	11,774	11,267	15,925	18,128	20,583
Number of irrigated farms	3,222	3,534	3,743	4,119	4,442
Operated by owners or managers	2,628	2,954	3,014	3,089	3,144
Operated by tenants	564	580	729	1,030	1,298
Number of towns	22	34	34	34	34
Population	101,235	110,442	111,833	120,846	122,178
Total population in towns and on farms	<sup>8</sup> 113,009	<sup>8</sup> 121,709	127,808	138,774	142,761
Number of public schools	103	49	73	75	76
Number of churches	106	110	115	120	120
Number of banks	13	13	9	8	11
Total amount of capital stock	\$2,950,000	\$2,950,000	\$2,675,000	\$2,000,000	\$2,750,000
Amount of deposits	\$28,194,815	\$30,000,000	\$27,323,442	\$26,500,000	\$29,277,000
Number of depositors	30,000	31,000	30,000	30,000	45,000

<sup>1</sup> Includes 1,120 acres, Fort Hancock.

<sup>2</sup> Includes 5,369 acres in Palomas and Fort Hancock, outside project limits, irrigated under surplus stored water contract.

<sup>3</sup> Project proper.

<sup>4</sup> Does not include 240 acres in Palomas, and 8,964 acres in Hancock section irrigated under surplus and waste-water contracts.

<sup>5</sup> Does not include 267 acres in Palomas and 10,800 acres in Hancock sections under Warren Act contracts.

<sup>6</sup> Total diversions, including water wasted and rediverted from river below.

<sup>7</sup> Includes delivery to farms by Bureau of Reclamation operation and to heads of community ditches on project.

<sup>8</sup> 5,000 soldiers included in El Paso's population.

## Appropriations

Fiscal year 1926:

Congressional authorizations	\$269,706.90
Disbursements	\$596,578.70
Liabilities outstanding	86,966.74
	653,543.44

Unencumbered balance June 30, 1926

16,223.46

Fiscal year 1927: Amount specified in appropriation acts

507,000.00

## Voucher transactions

	Reclamation fund	Rio Grande Dam	Increase of compensation (net)	Total
Disbursements and net transfers	\$15,629,287.41	\$1,000,000.00	\$441,171.78	\$17,070,459.19
Less collections	3,634,599.68			3,634,599.68
Net investment June 30, 1926	11,994,687.73	1,000,000.00	441,171.78	13,435,859.51

## Construction account

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction	\$269,457.82	\$14,071,706.04
Operation and maintenance prior to public notice (net)	<sup>1</sup> 12,740.08	287,676.86
		\$13,784,029.18
Less:		
Nonreimbursable Rio Grande Dam appropriation		1,000,000.00
Construction revenues	2,047.92	39,393.52
		1,039,393.52
Total to be paid by water users	264,669.82	12,744,635.66
Contracted repayments: Contracts, Elephant Butte Irrigation district and El Paso water improvement district No. 1		13,500,000.00

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$328,863.38	\$1,232,873.76	\$336,913.10	\$1,412,563.54
Operation and maintenance returns:				
Contracted.....	312,808.14	1,212,509.86	306,014.02	1,205,715.74
Penalties.....		1,428.46	1,491.51	2,917.97
Discounts.....		4,486.44		4,486.44
Miscellaneous revenue.....	16,055.24	23,423.88	21,919.93	29,479.07
Total.....	328,863.38	1,232,873.76	329,425.46	1,233,626.34
Results: Deficit.....			7,487.64	178,937.20

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Un- collected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$232,985.70	\$705,330.90	\$232,926.14	\$705,271.34			\$59.56
Charges paid in advance.....			17,094.30	30,000.00			
Operation and maintenance:							
Irrigation districts (150- 000 approximate acres).....	282,114.40	1,091,260.20	246,790.25	1,044,361.75		\$4,486.44	42,412.01
Penalties and interest.....	1,491.51	2,917.97	1,491.51	2,917.97			
Charges paid in advance.....			189.40				
Refunds.....				333.52			
Miscellaneous:							
Rentals of irrigation water.....	34,809.01	1,179,727.69	48,407.33	1,166,622.84			13,104.85
Rentals power and light.....		2,243.33		2,243.33			
Rentals grazing and farming lands.....	466.58	2,578.28	515.08	2,578.28			
Penalties and interest.....	1515.80	3,037.96	1515.80	3,037.96			
Other.....			25,739.60	677,232.69			20,896.35
Grand total collections.....			572,359.01	3,634,599.68			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 0 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 3.9 per cent of total accruals.

**OREGON, UMATILLA PROJECT**

The Umatilla project is located in Umatilla and Morrow Counties, Oreg., and is traversed by the main line of the Oregon-Washington Railroad & Navigation Co. and the Columbia River Highway. The average elevation of the irrigable area is 470 feet above sea level, the average rainfall is 8.62 inches for 15 years, and the length of the irrigation season will approximate 210 days. The principal products are alfalfa, fruits, vegetables, honey, and dairy products.

*Operation and settlement data, Umatilla project*

Item	1921	1922	1923	1924	1925
Area for which bureau was prepared to supply water	24,400	24,592	24,470	24,470	24,587
Miles of canal operated	177	186	188	193	198
Acreage irrigated	13,150	13,273	13,330	13,130	13,345
Water diverted (acre-feet)	130,872	129,187	127,504	113,816	135,051
Water delivered to land (acre-feet)	57,492	59,313	62,142	59,427	73,780
Per acre of land irrigated (acre-feet)	4.37	4.47	4.63	4.52	5.53
Total number of farms on project	1,000	1,000	1,011	1,011	1,011
Population	1,562	1,613	1,491	1,529	1,394
Number of irrigated farms	544	558	540	534	538
Operated by owners or managers	442	435	418	367	362
Operated by tenants	102	123	122	167	176
Population	1,562	1,613	1,491	1,529	1,394
Number of towns	4	4	4	4	4
Population	1,280	1,280	1,280	1,280	1,280
Total population of towns and farms	2,842	2,893	2,771	2,809	2,674
Number of public schools	6	6	6	6	6
Number of churches	9	9	9	9	9
Number of banks	1	1	1	1	1
Total capital stock	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Amount of deposits	\$235,367	\$300,000	\$300,000	\$290,000	\$265,000
Number of depositors	1,200	1,200	1,200	1,200	1,200

*Appropriations*

Fiscal year 1926:		
Congressional authorizations		\$840,000.00
Disbursements	\$548,816.48	
Liabilities outstanding	110,679.28	
		659,496.76
Unencumbered balance June 30, 1926		180,504.24
Fiscal year 1927: Amount specified in appropriation acts		407,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers	\$5,806,699.03	\$47,945.96	\$5,854,644.99
Less collections	991,899.92		991,899.92
Net investment June 30, 1926	4,814,799.11	47,945.96	4,862,745.07

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction	\$701,433.04	\$4,340,659.89
Supplemental construction	16,062.09	654,159.42
Total construction cost	717,495.13	4,994,819.31
Operation and maintenance deficits and arrearages to be repaid with construction		190,627.95
		\$5,185,447.26
Less:		
Contributed funds		1,000.00
Construction revenues	2,261.55	25,896.65
		29,896.65
Total to be repaid by water users	715,208.58	5,155,560.61
Contracted repayments, water-rights contracts:		
Individuals		9,897.00
Warren Act		1,723,550.00
Irrigation districts		2,690,376.97
Total		4,423,823.97

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$35, 275. 38	\$657, 754. 05	\$35, 896. 73	\$676, 961. 29
Operation and maintenance returns:				
Contracted.....	23, 940. 88	424, 831. 37	23, 940. 88	424, 831. 37
Penalties.....		6, 375. 70	1, 375. 44	7, 751. 14
Discounts.....	11. 54	3, 306. 71	5. 08	3, 310. 79
Miscellaneous revenues.....	980. 00	39, 224. 74	908. 58	39, 653. 32
Subtotals.....	24, 909. 34	467, 126. 10	26, 219. 82	468, 955. 04
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		190, 627. 95		190, 627. 95
Total.....	24, 909. 34	657, 754. 05	26, 219. 82	659, 582. 99
Results: Deficit.....	10, 366. 04		9, 676. 91	17, 378. 30

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$94,411.22	\$659,635.02	\$2,807.38	\$390,485.03			\$269,149.99
Contributed funds.....		1,000.00		1,000.00			
Total.....	94,411.22	660,635.02	2,807.38	391,485.03			269,149.99
Charges paid in advance.....			12,389.51	12,302.06			
Refunds.....				63.00			
Operation and maintenance:							
Water-right charges project lands—(111 acres).....	236.38	2,476.68	123.65	1,824.73	\$3.48	\$112.45	539.50
Warren Act lands (25,120 approximate acres).....	77.00	822.45	106.40	791.64	1.60	30.81	
Irrigation districts (24,356 approximate acres).....	39,447.28	399,665.47	7,768.45	316,696.38		3,167.53	79,801.56
Total.....	39,760.66	402,964.60	7,997.50	319,312.75	5.08	3,310.79	80,341.06
Penalties and interest.....		6,375.70		6,375.70			
Charges paid in advance.....				390.00			
Refunds.....				9.55			
Miscellaneous:							
Rentals of irrigation water.....	718.98	34,864.52	718.98	34,864.52			
Rentals of grazing and farm- ing lands.....	357.15	2,897.90	508.15	2,825.90			72.00
Construction forfeitures.....				6,701.14			
Construction penalties and interest.....	58.08	20,776.45	58.08	20,776.45			
Operation and maintenance penalties and interest.....	920.96	8,376.67	920.96	8,376.67			
Other.....			19,165.46	188,517.16			1,247.37
Grand total collections.....			29,787.00	991,899.92			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 40.8 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 19.9 per cent of total accruals.

## OREGON-CALIFORNIA, KLAMATH PROJECT

The Klamath project is located in southern Oregon and northern California. The irrigation season usually begins about May 1 and ends on September 30. The average elevation of the project is 4,100 feet above sea level; the average rainfall is about 13 inches; the temperature ranges from  $-16^{\circ}$  to  $105^{\circ}$  F. The principal products are alfalfa, wheat, oats, barley, potatoes, livestock, and dairy products. The principal markets are Portland, Oreg., and Sacramento and San Francisco, Calif.

*Operation and settlement data, Klamath project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau is prepared to supply water:					
Main, Tule Lake, pumping divisions, and Van Brimmer lands.....	51,000	51,000	54,100	53,900	55,200
Langell Valley division.....					13,000
Horsefly irrigation district.....					10,400
Acreage irrigated:					
Main, Tule Lake, pumping divisions, and Van Brimmer lands.....	44,883	44,929	46,624	47,300	42,900
Langell Valley division.....					4,100
Horsefly irrigation district.....					5,900
Miles of canal operated—Main and Tule Lake divisions.....	225	225	277	277	277
Water diverted, exclusive of Langell Valley division and Horsefly irrigation district (acre-feet).....	106,104	119,830	124,187	168,980	137,570
Water delivered to land, exclusive of Langell Valley division and Horsefly irrigation district (acre-feet).....	48,713	49,862	56,619	69,100	54,400
Per acre of land irrigated, exclusive of Langell Valley division and Horsefly irrigation district (acre-feet).....	1.11	1.11	1.21	1.48	1.27
Total number of farms on project:					
Main and Tule Lake divisions.....	412	414	467	485	507
Population.....	1,314	1,300	1,400	1,500	1,680
Balance of project (estimated).....	158	156	133	115	240
Population (estimated).....	486	500	400	400	800
Number of farms irrigated—Main and Tule Lake divisions.....	412	414	467	485	440
Operated by owners or managers.....	353	297	336	356	356
Operated by tenants.....	59	117	131	129	84
Population.....	1,314	1,300	1,400	1,200	1,680
Number of towns.....	5	5	5	5	5
Population.....	5,809	6,200	7,000	7,000	9,020
Total population towns and farms.....	7,600	8,000	8,800	8,900	11,500
Number of public schools.....	22	22	24	24	30
Number of churches.....	10	10	11	13	13
Number of banks.....	5	5	5	5	5
Total capital stock.....	\$545,000	\$255,000	\$350,000	\$355,000	\$355,000
Amount of deposits.....	\$3,500,000	\$3,500,000	\$4,200,000	\$4,500,000	\$5,000,000
Number of depositors.....	8,900	8,000	8,200	8,200	9,500

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$561,000.00
Disbursements.....	\$149,732.53	
Liabilities outstanding.....	11,414.30	
		161,166.83

Unencumbered balance June 30, 1926.....

399,833.17

Fiscal year 1927: Amount specified in appropriation acts.....

140,000.00

<sup>1</sup> Plus unexpended balance of 1926 appropriation.

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$6,090,719.78	\$72,790.02	\$6,163,509.80
Less collections.....	1,723,010.08		1,723,010.08
Net investment June 30, 1926.....	4,367,709.70	72,790.02	4,440,499.72

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$112,701.77	\$4,634,562.58
Supplemental construction.....		545,873.53
Value of works taken over.....		6,705.07
Total construction cost.....	112,701.77	5,187,141.18
Operation and maintenance prior to public notice (net).....	7,236.16	66,019.09
Operation and maintenance deficits and arrearages to be repaid with construction.....		3,712.08
Less construction revenues.....	32,922.73	\$5,256,872.30
Total to be repaid by water users.....	87,015.20	234,046.12
Contracted repayments, water-right contracts:		
Individuals.....	1,679.50	262,382.20
Warren Act.....		458,728.74
Irrigation districts.....	3,456.00	3,024,232.76
Special.....		254,508.40
Total.....	5,135.50	3,999,852.10

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$77,624.51	\$764,210.87	\$70,843.22	\$802,506.12
Operation and maintenance returns:				
Contracted.....	63,774.05	738,874.70	63,605.18	738,690.83
Penalties.....	341.75	3,159.63	151.67	3,255.38
Discounts (contra).....	63.82	4,709.78	114.22	4,760.18
Miscellaneous revenues.....	1,785.91	14,617.81	1,863.17	14,907.01
Subtotals.....	65,837.89	751,942.36	65,505.80	752,093.04
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....		3,712.03		3,712.03
Total.....	65,837.89	755,654.39	65,505.80	755,805.07
Results: Deficit.....	11,786.62	8,556.48	5,337.42	46,701.06

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$65,172.06	\$757,864.57	\$52,461.74	\$713,806.69			\$44,057.88
Charges paid in advance.....				223.58			
Refunds.....			994.50	3,462.15			
Operation and maintenance:							
Water-right charges, project lands (individual contracts, 3,464.4 acres).....	4,759.34	25,856.99	4,911.81	22,295.65	\$114.22	\$537.17	3,024.17
Warren Act lands (9,854.4 approximate acres).....	883.85	4,472.29	1,074.55	4,393.70			78.59
Irrigation districts (41,524.3 approximate acres).....	65,701.76	654,390.55	56,403.88	583,544.93		29,816.96	41,018.06
Total.....	71,344.95	684,709.83	62,390.24	610,234.28	114.22	30,354.13	44,121.42
Penalties and interest.....	151.67	3,255.38	151.67	3,255.38			
Charges paid in advance.....			1.84	44.59			
Refunds.....				60.75			
Miscellaneous:							
Rentals of irrigation water.....	1,888.17	54,593.56	1,916.83	54,497.72			95.84
Rentals power and light.....	175.75	7,872.93	175.75	7,872.93			
Rentals grazing and farming lands.....	34,968.27	236,717.72	34,134.85	235,800.30		84.00	833.42
Construction forfeitures.....			1,485.42	6,573.82			
Penalties and interest:							
Construction.....			742.89	3,676.70			
Operation and maintenance.....			1,172.73	3,902.21			
Other.....			4,832.77	79,596.96			946.20
Grand total collections.....			100,461.23	1,723,010.06			

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 5.8 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 6.4 per cent of total accruals.

**SOUTH DAKOTA, BELLE FOURCHE PROJECT**

The Belle Fourche project is located in western South Dakota, a little north and east of the Black Hills. The climate is semiarid, with an average annual rainfall of about 14 inches; the temperatures range from  $-38^{\circ}$  to  $105^{\circ}$  F. The character of the soils varies from light sandy loam to heavy clay, the clay soils predominating. The principal products are alfalfa, wheat, oats, corn, potatoes, sugar beets, garden truck, and livestock, the chief markets for which are Omaha, Minneapolis, and Chicago.

*Operation and settlement data, Belle Fourche project*

	1921	1922	1923	1924	1925
Acreage for which bureau is prepared to supply water.....	83,328	82,190	81,900	81,870	181,870
Acreage irrigated.....	55,100	31,150	30,550	48,400	48,800
Miles of canal operated.....	615	545	506	455	455
Water diverted (acre-feet) from Belle Fourche River.....	86,791	115,629	99,176	101,915	138,897
Water delivered to farms (acre-feet).....	71,715	28,421	22,290	57,923	63,122
Per acre of land irrigated (acre-feet).....	1.3	1.09	0.73	1.20	1.30
Total number of farms on project.....	953	953	953	965	965
Population.....	2,700	2,700	2,700	2,020	1,850
Number of irrigable farms.....	953	953	953	965	965
Owners on farms.....	418	371	320	276	256
Tenants on farms.....	165	169	182	178	178
Neither owners nor tenants on farms.....	370	413	451	511	531
Population.....	2,510	2,213	2,035	2,020	1,850
Number of towns.....	4	4	4	4	4
Population.....	650	726	731	715	715
Total population in towns and on farms.....	3,160	2,939	2,766	2,735	2,565
Number of public schools.....	24	24	25	27	27
Number of churches.....	9	9	9	9	9
Number of banks.....	9	9	6	4	4
Total capital stock.....	\$250,000	\$250,000	\$150,000	\$135,000	\$135,000
Amount of deposits.....	\$2,373,380	\$2,606,200	\$2,145,000	\$2,125,000	\$2,125,000
Number of depositors.....		6,500	5,000	6,000	6,000

<sup>1</sup> Resurvey shows 61,587 net area subject to water charges.

<sup>2</sup> Served with water, 824; cropped without irrigation, 22; idle, 119; operated by owners or managers, 371; operated by tenants, 475.

<sup>3</sup> City of Belle Fourche omitted.

<sup>4</sup> Estimated.

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$165,000.00
Disbursements.....		\$54,959.20
Liabilities outstanding.....		\$,896.44
		64,855.64
Unencumbered balance, June 30, 1926.....		100,144.36
Fiscal year 1927: Amount specified in appropriation acts.....		40,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,717,703.68	\$37,170.22	\$50,273.32	\$4,805,147.22
Less collections.....	1,143,294.44			1,143,294.44
Net investment, June 30, 1926.....	3,574,409.24	37,170.22	50,273.32	3,661,852.78

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....		\$3,531,454.53
Supplemental construction.....		34,069.88
Total construction cost.....		3,566,124.41
Operation and maintenance prior to public notice (net).....		1,989.03
Operation and maintenance deficits and arrearages to be repaid with construction.....		506,436.99
Less construction revenues.....		\$4,070,572.37
		16,565.35
Total to be repaid by water users.....		4,054,007.02
Contracted repayments: Contract, Belle Fourche Irrigation district.....		4,345,277.42

<sup>1</sup> Contra.



*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$72,976.89	\$1,161,290.26	\$72,370.57	\$1,195,822.73
Operation and maintenance returns:				
Contracted.....	75,000.00	713,721.89	75,000.00	713,721.89
Penalties.....		31,955.32		31,955.32
Discounts (contra).....		9,241.55		9,241.55
Miscellaneous revenues.....	2,211.74	14,689.18	2,073.24	15,900.13
Subtotals.....	77,211.74	751,124.84	77,073.24	752,335.79
Other credits: Operation and maintenance deficits and arrearages to be repaid with con- struction.....		506,436.99		506,436.99
Total.....	7,211.74	1,257,561.83	77,073.24	1,258,772.78
Results: Excess.....	4,234.85	96,301.57	4,702.67	62,950.05

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$137,078.24	\$796,373.20	\$7,108.57	\$478,866.62		\$266.57	\$317,240.01
Charges paid in ad- vance.....			7,108.57	1,854.37			
Refunds.....				423.42			
Operation and mainte- nance:							
Water-right charges, ir- rigation district (71, 041.25, approximate, acres).....	78,068.96	679,927.27	57,425.90	540,768.22		9,276.82	129,782.22
Penalties and interest.....		31,955.32		17,824.29	\$1,029.06	11,361.55	2,769.48
Charges paid in ad- vance.....			13,709.31	17,811.46			
Refunds.....				384.97			
Miscellaneous:							
Rentals of irrigation water.....	464.45	6,465.34	464.45	6,297.54		17.80	150.00
Rentals, grazing and farming lands.....	369.17	1,356.28	329.17	1,214.68			141.60
Construction forfeit- ures.....				1,116.10			
Penalties and interest— Construction.....	5,916.84	30,031.63	907.15	18,847.88	313.95	25.71	11,158.04
Operation and maintenance.....	2,696.34	6,926.30	527.49	4,757.45			2,168.85
Miscellaneous.....	8.98	8.98	8.98	8.98			
Other.....			1,050.81	53,118.46			638.36
Grand total collec- tions.....			47,004.64	1,143,294.44			

<sup>1</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 89.3 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 19.1 per cent of total accruals.

**UTAH, STRAWBERRY VALLEY PROJECT**

The Strawberry Valley project is located in the north central part of Utah; the irrigable area lies along the southeastern shore of Utah Lake in Utah County and the storage works in Wasatch County, 30 miles east of Springville. The length of the irrigation season is 169 days, from April 15 to September 30. The average elevation of the project lands is about 4,600 feet above sea level. The average rainfall at Payson for a period of 16 years is 18½ inches, most of which

occurs from September 1 to May 1. The climate is temperate, varying from 0° to 95° F. The last killing frost in the spring usually occurs prior to May 10 and the first in the fall after October 1. The soil varies from sandy loam to heavy clay and varying mixtures of both, with black alluvium and loam in the bottom lands. The mesa lands are sandy loam underlain with gravel, so that natural drainage is excellent. The principal crops are wheat, oats, barley, millet, alfalfa, timothy, sugar beets, potatoes, corn, cane, apples, plums, pears, peaches, prunes, apricots, cherries, melons, and all kinds of vegetables. Sugar beets, cereals, and hay constitute the staple crops.

*Operation and settlement data, Strawberry Valley project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	53,889	53,889	53,890	53,890	53,890
Acreage irrigated.....	<sup>1</sup> 47,446	<sup>1</sup> 47,446	<sup>1</sup> 47,460	<sup>1</sup> 47,560	<sup>1</sup> 47,772
Miles of canal operated.....	9.3	9.3	9.3	9.3	9.3
Water diverted (acre-feet).....	83,000	79,500	83,800	<sup>1</sup> 113,750	75,254
Water delivered to land (acre-feet).....	71,200	73,401	79,674	106,203	73,300
Per acre of land irrigated (acre-feet).....	1.50	1.55	1.68	2.23	2.17
Total number of farms on project.....	3,200	3,200	3,113	3,113	3,113
Population.....	7,000	7,000	7,000	7,000	7,000
Number of irrigated farms.....	2,740	2,741	2,741	2,741	2,742
Operated by owners.....	2,340	2,291	2,291	2,300	2,300
Operated by tenants.....	400	450	450	441	442
Population.....	6,500	6,500	6,500	6,500	6,500
Number of towns.....	12	12	12	12	12
Population.....	16,000	16,000	16,000	16,200	16,200
Total population of towns and farms.....	23,000	23,000	23,000	23,200	23,200
Number of public schools.....	22	22	23	24	26
Number of churches.....	23	25	25	26	26
Number of banks.....	6	6	<sup>1</sup> 4	5	5
Total capital stock.....	\$285,000	\$285,000	\$210,000	\$235,000	\$235,000
Amount of deposits.....	\$1,750,000	\$1,900,000	<sup>1</sup> \$1,429,354	\$1,500,900	\$1,750,000
Number of depositors.....	10,000	10,000	<sup>1</sup> 7,000	7,250	8,350

<sup>1</sup> Project proper, 34,290 acres.

<sup>2</sup> 36,000 acre-feet of water distributed free and rented for irrigation purposes for replanting and to make up water shortages due to low natural run-off.

<sup>3</sup> 2 bank failures during the year.

<sup>4</sup> Figures do not include 2 banks closed during 1923.

*Appropriations*

Fiscal year 1926:	
Congressional authorizations.....	\$39,500.00
Disbursements.....	\$37,474.87
Liabilities outstanding.....	521.23
	37,996.10
Unencumbered balance to June 30, 1926.....	1,503.90
Fiscal year 1927: Amount specified in appropriation acts.....	39,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$4,278,727.82	\$440.00	\$34,682.99	\$4,313,850.81
Less collections.....	1,652,796.34			1,652,796.34
Net investment June 30, 1926.....	2,625,931.48	440.00	34,682.99	2,661,054.47

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	\$95.42	\$3,499,734.22
Operation and maintenance prior to public notice (net).....	1,980.70	11,131.20
Operation and maintenance deficits and arrearages to be repaid with construction.....	2,275.75	3,622.08
Less construction revenues.....	11,912.74	\$3,514,467.50
		64,528.53
Total to be repaid by water users.....	9,822.27	3,449,938.97
Contracted repayments, water-right contracts:		
Individuals.....	10,245.00	2,464,131.96
Warren Act.....	675.00	84,375.00
Irrigation districts.....		480,659.00
Special.....		105,180.00
Total.....	10,920.00	3,114,336.96

<sup>1</sup> Contra.*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$21,447.26	\$418,419.22	\$21,586.14	\$428,240.13
Operation and maintenance returns:				
Contracted.....	16,788.87	402,020.16	17,153.87	402,020.16
Penalties.....	1,265.01	7,520.68	1,428.53	7,861.79
Discounts (contra).....	1,181.90	11,462.06	1,212.99	11,783.40
Miscellaneous revenues.....	2,417.20	19,500.63	2,361.16	19,719.42
Sub-totals.....	19,280.18	417,579.41	19,730.57	417,817.97
Other credits: Operation and maintenance defi- cits and arrearages to be repaid with construc- tion.....	2,275.75	3,622.08	2,275.75	3,622.08
Total.....	21,564.93	421,201.49	22,006.32	421,440.05
Results:				
Excess.....	117.67	2,782.27	420.18	
Deficit.....				6,800.08

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction: Water-right charges.....	\$167,825.17	\$633,144.44	\$105,850.46	\$662,488.64	-----	-----	\$270,655.80
Operation and mainte- nance:							
Water-right charges, project lands (32,286 acres).....	33,980.38	341,133.55	26,290.38	272,514.16	\$851.59	\$9,999.67	58,619.72
Warren Act lands (5,486 approximate acres).....	2,039.32	16,405.36	1,654.57	14,467.59	74.15	562.92	1,374.85
Irrigation districts (10,000 approximate acres).....	5,745.00	44,481.25	5,457.75	43,260.44	287.25	1,220.81	-----
Total.....	\$41,764.70	\$402,020.16	\$33,402.70	\$330,242.19	\$1,212.99	\$11,783.40	\$9,994.57
Penalties and interest.....	1,428.53	7,861.79	1,074.92	6,793.27	-----	-----	1,068.52
Charges paid in ad- vance.....			\$1.59	-----	-----	-----	
Refunds.....				36.48	-----	-----	
Miscellaneous:							
Rentals of irrigation water.....	2,702.00	17,000.54	2,702.00	17,000.54	-----	-----	
Rentals, power, and light.....	29,464.51	206,797.61	29,957.97	203,156.70	-----	-----	3,640.91
Rentals, grazing, and farming lands.....	20,880.50	187,631.56	20,880.50	187,631.56	-----	-----	
Construction forfeit- ures.....				278.75	-----	-----	
Construction penalties and interest.....	8,395.09	27,601.42	6,670.67	24,446.95	-----	-----	3,154.47
Other.....			15.13	220,721.26	-----	-----	
Grand total collec- tions.....			200,552.76	1,652,796.34	-----	-----	

<sup>1</sup> Actual construction accruals for year..... \$177,163.67  
 Deferred under sec. 2, act of May 9, 1924..... 9,338.50

Net accruals..... 167,825.17

<sup>2</sup> Actual operation and maintenance accruals for year..... \$44,040.45  
 Deferred under sec. 2, act of May 9, 1924..... 2,275.76

Net accruals..... 41,764.70

<sup>3</sup> Contra.....

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 29 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1926, 14.9 per cent of total accruals.

**WASHINGTON, OKANOGAN PROJECT**

The Okanogan project is located in Okanogan County, Wash., on a branch of the Great Northern Railway running from Wenatchee to Oroville, Wash. The length of the irrigation season is 153 days from May 1 to September 30. The average elevation of the project is 1,000 feet above sea level; the average rainfall is about 11.5 inches; the temperature ranges from 108° to -10° F. The soil is volcanic ash and gravel on the upper benches and sand and gravel on the lowlands along the Okanogan River. The principal crop of the project is apples, with some peaches, pears, small fruits, hay, and vegetables. The principal markets are the States east.

*Operation and settlement data, Okanogan project*

Item	1921	1922	1923	1924	1925
Acreage for which the bureau was prepared to supply water.....	8,200	7,676	7,600	7,500	7,500
Acreage irrigated.....	5,644	5,569	5,162	4,940	4,976
Miles of canal operated.....	87	69	69	70	70
Water diverted (acre-feet).....	21,886	21,318	20,488	13,584	15,567
Water delivered to land (acre-feet).....	16,631	16,265	13,634	8,882	10,962
Per acre of land irrigated (acre-feet).....	2.95	2.75	2.64	1.80	2.21
Total number of farms on project.....	504	473	510	510	510
Population.....	1,220	1,363	1,430	1,261	1,267
Number of irrigated farms.....	439	447	458	453	463
Operated by owners or managers.....	388	390	399	404	411
Operated by tenants.....	51	57	59	49	52
Population.....	1,220	1,363	1,430	1,261	1,267
Number of towns.....	3	3	3	3	3
Population.....	2,150	2,300	2,600	3,000	3,000
Total population in towns and on farms.....	3,370	3,663	4,030	4,261	4,267
Number of public schools.....	6	6	7	7	6
Number of churches.....	8	8	8	9	9
Number of banks.....	5	5	5	4	4
Total capital stock.....	\$155,000	\$155,000	\$155,000	\$140,000	\$140,000
Amount of deposits.....	\$1,043,000	\$966,000	\$1,000,000	\$1,228,000	\$1,358,000
Number of depositors.....	2,200	2,250	2,350	2,400	2,400

*Appropriations*

Fiscal year 1926:	
Congressional authorizations.....	\$79,500.00
Disbursement.....	\$69,578.12
Liabilities outstanding.....	6,600.14
	76,238.26
Unencumbered balance June 30, 1926.....	3,261.74
Fiscal year 1927: Amount specified in appropriation acts.....	65,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$1,989,134.37	\$47,767.18	\$2,036,901.55
Less collections.....	561,398.92		561,398.92
Net investment June 30, 1926.....	1,427,735.45	47,767.18	1,475,502.63

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....		\$841,536.61
Supplemental construction.....	\$1,080.82	618,954.25
Total construction cost.....	1,080.82	\$1,460,490.86
Operation and maintenance prior to public notice (net).....		47,766.87
Operation and maintenance deficits and arrearages to be repaid with construction.....	15,447.58	26,194.57
Less construction revenues.....	359.17	1,437,918.36
Total to be repaid by water users.....	14,067.59	6,257.80
Contracted repayments:		
Water-right contracts (individuals).....	120.00	3,275.00
Contract-Okanogan Irrigation district.....	15,567.58	1,510,012.87
		1,513,287.87

<sup>1</sup> Contra.

*Operation and maintenance account*

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
<b>Operation and maintenance cost.....</b>	<b>\$71,068.62</b>	<b>\$523,746.21</b>	<b>\$74,483.58</b>	<b>\$552,246.27</b>
<b>Operation and maintenance returns:</b>				
Contracted.....	55,459.92	414,430.28	58,959.92	417,980.28
Penalties.....	3,842.57	13,280.81	5,774.94	17,422.26
Discounts (contra).....	5.70	370.73	11.70	376.73
Miscellaneous revenues.....	2,040.12	70,159.95	868.27	69,358.10
Subtotals.....	61,336.91	497,500.31	65,591.43	504,333.91
<b>Other credits: Operation and maintenance deficits and arrearages to be repaid with con- struction.....</b>	<b>15,447.58</b>	<b>25,194.37</b>	<b>15,447.58</b>	<b>25,194.37</b>
<b>Total.....</b>	<b>76,784.49</b>	<b>522,694.68</b>	<b>81,039.01</b>	<b>529,528.28</b>
<b>Results:</b>				
Excess.....	5,715.87		6,555.43	
Deficit.....		1,051.53		22,717.99

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$24,008.56	\$105,665.01	\$8,738.82	\$73,553.22			\$32,111.79
Charges paid in advance.....				128.06			
Refunds.....				75.20			
Operation and maintenance:							
Water-right charges, project lands (41 acres).....	307.50	1,474.00	262.50	1,264.07	\$11.70	\$23.93	186.00
Irrigation districts (6,672 acres)	65,816.00	384,156.28	40,905.71	308,305.23		2,606.38	73,242.67
Total.....	66,123.50	385,630.28	41,168.21	309,569.30	11.70	2,632.31	73,428.67
Penalties and interest.....	5,774.94	17,422.26	5,774.94	16,843.90		578.36	
Refunds.....			5.70	58.20			
Miscellaneous:							
Rentals of irrigation water.....	356.40	109,970.88	726.40	107,386.69		2,584.19	
Rentals of power and light.....		1,754.71		1,754.71			
Rentals of grazing and farm- ing lands.....	9.00	865.50	9.00	865.50			
Construction forfeitures.....				97.50			
Construction penalties and interest.....	3,782.64	6,523.72	3,782.64	6,523.72			
Other.....			1,523.11	44,542.92			2,417.69
Grand total collections.....			61,728.82	561,398.92			

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 40.4 per cent of total accruals. Uncollected operation and maintenance charges as of June 30, 1926, 19.04 per cent of total accruals.

**WASHINGTON, YAKIMA PROJECT**

The Yakima project, comprising the Sunnyside, Tieton, Kittitas, Moxee, Roza, and Kennewick divisions, is located in Kittitas, Yakima, and Benton Counties, Wash. The irrigation season on the Sunnyside division extends from April 1 to October 31 (214 days), and on the Tieton from April 20 to September 30 (164 days). The water duty on the Sunnyside division is 3 acre-feet per acre, and on the Tieton division 2.4 acre-feet per acre. The soil is volcanic ash, sandy loam, and decomposed basalt. The principal products are alfalfa, apples, pears, peaches, grains, potatoes, sugar beets, hops, stock, and dairy products.

*Operation and settlement data, Sunnyside division, Yakima project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau was prepared to supply water.....	101,509	101,889	101,329	102,350	102,325
Acreage irrigated.....	94,500	96,000	96,000	96,000	96,000
Miles of canal operated.....	606	606	606	606	606
Water diverted (acre-feet).....	440,348	421,950	452,908	446,160	554,988
Water delivered to land (acre-feet).....	309,709	301,638	313,800	321,496	324,806
Per acre of land irrigated (acre-feet).....	3.28	3.18	3.30	3.38	3.52
Total number of farms on project.....	3,065	3,138	3,181	3,391	3,326
Population.....	12,080	12,332	10,128	9,617	10,306
Number of irrigated farms.....	3,065	3,138	3,181	3,391	3,326
Operated by owners or managers.....	2,322	2,375	2,157	2,287	2,280
Operated by tenants.....	743	763	1,024	1,104	1,046
Population.....	12,080	12,332	10,128	9,617	10,306
Number of towns.....	11	11	11	11	11
Population.....	6,941	7,250	7,250	7,410	7,526
Total population of towns and farms.....	19,021	19,582	17,378	17,027	17,731
Number of public schools.....	41	41	41	41	41
Number of churches.....	30	30	30	30	30
Number of banks.....	13	12	12	10	9
Total capital stock.....	\$397,000	\$367,000	\$360,000	\$285,000	\$280,000
Amount of deposits.....	\$2,914,608	\$2,615,415	\$2,281,606	\$2,377,944	\$2,751,693
Total number of depositors.....	11,643	10,556	9,348	9,239	8,997

*Operation and settlement data, Tieton division, Yakima project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau prepared to supply water.....	32,000	32,000	32,000	32,000	32,000
Acreage irrigated.....	28,500	28,700	28,550	27,970	27,650
Miles of canal operated.....	335	335	335	335	335
Water diverted (acre-feet).....	100,844	93,754	96,541	95,001	96,909
Water served to land (acre-feet).....	71,148	71,105	72,182	73,870	70,196
Per acre of land irrigated (acre-feet).....	2.50	2.48	2.55	2.64	2.54
Total number of farms on project.....	1,480	1,480	1,480	1,480	1,400
Population.....	3,457	3,542	3,453	3,480	3,490
Number of irrigated farms.....	1,300	1,300	1,305	1,300	1,320
Operated by owners or managers.....	1,010	965	875	880	910
Operated by tenants.....	290	335	430	450	410
Population.....	3,457	3,542	3,453	3,480	3,490
Number of towns.....	8	8	8	8	8
Population.....	23,000	23,000	23,000	23,000	25,700
Total population of towns and farms.....	26,457	26,542	26,453	26,480	29,190
Number of public schools.....	10	10	10	10	10
Number of churches.....	4	4	4	4	4

*Operation and settlement data, Kittitas division, Yakima project*

	1925		1925
Total number of farms on project.....	355	Number of churches.....	16
Population.....	1,065	Number of banks.....	6
Number of towns.....	5	Total capital stock.....	\$375,000
Population.....	8,100	Amount of deposits.....	\$4,446,000
Total population of towns and farms.....	9,165	Total number of depositors.....	10,300
Number of public schools.....	25		

*Appropriations*

<b>Fiscal year 1926:</b>		
Congressional authorizations.....		\$306,000.00
Disbursements.....		
Liabilities outstanding.....		\$277,964.58
		15,580.42
		298,545.00
Unencumbered balance June 30, 1926.....		11,455.00
<b>Fiscal year 1927: Amount specified in appropriation acts.....</b>		<b>294,000.00</b>

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$17,677,785.34	\$71,999.46	\$286,734.74	\$18,086,499.54
Less collections.....	8,083,976.56			8,083,976.56
Net investment June 30, 1926.....	9,593,788.78	71,999.46	286,734.74	9,952,522.98

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	1 <sup>1</sup> \$41,362.84	\$14,217,069.62
Value of works taken over.....		37,092.41
Supplemental construction.....	9,848.23	145,779.69
Construction penalties funded.....	5,661.33	5,661.33
Total construction cost.....	25,853.28	14,405,603.05
Operation and maintenance prior to public notice (net) credit.....		1 63,957.96
Operation and maintenance deficits and arrearages to be repaid with construction.....		77,238.54
		\$14,418,883.63
Less:		
Contributed funds.....	1 1,000.00	62,736.50
Construction revenues.....	9,320.41	271,234.54
		333,971.04
Total to be repaid by water users.....	1 34,173.69	14,084,912.59
Contracted repayments, water-right contracts:		
Individuals.....		3,434,540.91
Warren Act.....	1,701,603.58	3,581,233.95
Irrigation districts.....	1,454.48	2,024,929.80
Special.....		2,279,600.00
Total.....	1,708,061.06	11,620,364.66

<sup>1</sup> Contra.<sup>2</sup> \$48,789.74 transferred to Kittitas division. Actual cost for year, \$7,426.90.*Operation and maintenance account*

	Calendar year 1926	To Dec. 31, 1926	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$258,204.57	\$3,082,041.57	\$256,698.31	\$3,165,507.56
Operation and maintenance returns:				
Contracts.....	247,700.37	2,904,365.56	248,340.51	2,971,927.13
Penalties.....	12,222.88	51,983.23	12,506.68	57,332.56
Discounts (contra).....	3,697.41	36,636.61	3,663.02	39,026.46
Miscellaneous revenues.....	6,879.95	100,945.95	7,612.61	106,215.78
Subtotal.....	263,106.79	3,020,678.12	264,806.73	3,096,449.01
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	125.54	77,238.54		77,238.54
Total.....	263,231.33	3,097,916.66	264,806.73	3,173,687.55
Results: Excess.....	5,026.76	65,875.09	8,110.42	8,179.99



*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water right charges.....	\$369,757.73	\$4,442,730.90	\$439,664.85	\$4,141,019.30		\$36,047.07	\$265,664.53
Contributed funds.....	\$1,000.00	62,736.50	\$1,000.00	62,736.50			
Total.....	368,757.73	4,505,467.40	438,664.85	4,203,755.80		36,047.07	265,664.53
Charges paid in advance.....			5,032.66	8,969.02			
Refunds.....				2,833.62			
Operation and maintenance:							
Water right charges project lands (31,996 acres).....	76,762.47	912,963.18	83,635.40	832,563.05	\$1,831.63	20,890.11	59,510.02
Warren Act lands (123,660.88 approximate acres).....	28,646.10	202,957.31	32,160.15	192,840.59	13.56	35.94	9,080.75
Irrigation districts (67,534.84 approximate acres).....	125,926.50	1,700,467.36	138,985.13	1,588,499.55	1,807.83	19,145.75	92,822.06
Other lands (84,610.87 approximate acres).....	17,005.44	155,539.28	16,145.44	150,839.28			5,700.00
Total.....	248,340.51	2,971,927.13	270,926.12	2,764,742.47	3,653.02	40,071.80	167,112.86
Penalties and interest.....	12,505.63	57,332.56	9,350.84	53,770.54			3,562.02
Charges paid in advance.....				101.14			
Refunds.....				1,045.65			
Miscellaneous:							
Rentals of irrigation water.....	4,100.34	151,467.50	4,683.74	150,624.44			843.06
Rentals of power and light.....		3,635.33		3,635.33			
Rentals of farming and grazing lands.....	2,099.55	27,131.24	2,150.75	26,971.24			160.00
Construction forfeitures.....				1,057.62			
Penalties and interest.....	40,169.94	113,459.98	28,776.35	102,066.39	5,661.33	5,661.33	5,732.25
Other.....			41,503.96	764,383.30			993.94
Grand total collections.....			801,089.27	8,063,976.56			

<sup>1</sup> Includes \$20,294.74 construction charges not due until July 1, 1926.<sup>2</sup> Contra.

NOTE.—Uncollected construction water-right charges as of June 30, 1923, 6.0 per cent of total accruals.  
 Uncollected operation and maintenance charges as of June 30, 1926, 5.6 per cent of total accruals.

## KITITAS DIVISION, YAKIMA PROJECT, WASHINGTON

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....	.....	\$2,750,000.00
Disbursements.....	\$36,654.10	
Liabilities outstanding.....	6,713.82	
		43,367.92
Unencumbered balance June 30, 1926.....		2,706,632.08
Fiscal year 1927: Amount specified in appropriation acts.....		(4)

<sup>1</sup> The unexpended balances of certain 1926 appropriations.

## Voucher transactions

	Reclamation fund	General investigations, 1923-24	Total
Disbursements and net transfers.....	\$147, 773. 78	\$34, 110. 70	\$181, 884. 48
Less collections.....	31, 002. 84		31, 002. 84
Net investment June 30, 1926.....	116, 770. 94	34, 110. 70	150, 881. 64

## Construction account

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works: Original construction.....	<sup>1</sup> \$148, 444. 19	\$148, 444. 19
Less:		
Contributed funds.....	<sup>2</sup> 1, 000. 00	\$1, 000. 00
Construction revenues.....	17. 50	17. 50
		1, 017. 50
Total to be repaid by water users.....	147, 426. 09	147, 426. 09
Contracted repayments, water-right contract: Kittitas reclamation district.....	9, 000, 000. 00	9, 000, 000. 00

<sup>1</sup> \$48,789.74 transferred from Yakima and \$52,292.99 from secondary and general investigations. Actual cost for fiscal year, \$47,361.46.

<sup>2</sup> Transferred from Yakima. No transactions during fiscal year.

## Status of current accounts receivable as of June 30, 1926

	Due		Collected (cash)		Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Rentals of grazing and farming lands.....	<sup>1</sup> \$7, 344. 42	\$7, 344. 42	<sup>1</sup> \$7, 344. 42	\$7, 344. 42	
Other.....			23, 658. 42	23, 658. 42	
Grand total collections.....			31, 002. 84	31, 002. 84	

<sup>1</sup> Transferred from secondary project accounts.

## WYOMING, RIVERTON PROJECT

The Riverton project lies in Fremont County, Wyo., northeast of Wind River and west of the Big Horn River. The irrigation season is from May 1 to September 30. The average altitude is 5,200 feet; the average annual rainfall is about 8 inches; the average maximum temperature is about 95° F.; and the average minimum temperature -27° F. The soil is a heavy loam. The principal products are alfalfa, cereals, sugar beets, and potatoes; and the principal markets, Omaha, Denver, and local.

## Operation and settlement data, Riverton project, 1925

Acreage which bureau is prepared to furnish water.....	1, 600	Number of towns.....	3
Acreage irrigated.....	80	Population.....	<sup>1</sup> 2, 300
Miles of canal operated.....	12	Total population of towns and farms.....	<sup>1</sup> 2, 301
Water diverted (acre-feet).....	230	Number of public schools.....	8
Water delivered to land (acre-feet).....	212	Number of churches.....	8
Total number of farms on project.....	1	Number of banks.....	3
Population.....	1	Total capital stock.....	\$100, 000
Number of irrigated farms.....	1	Amount of deposits.....	<sup>1</sup> \$650, 000
Operated by owner or manager.....	1	Number of depositors.....	<sup>1</sup> 2, 600
Population.....	1		

<sup>1</sup> Estimated.

*Appropriations*

<b>Fiscal year 1926:</b>			
Congressional authorizations.....			\$755,000.00
Disbursements.....	\$539,344.72		
Liabilities outstanding.....	61,275.24		
			600,619.96
Unencumbered balance due June 30, 1926.....			154,280.04
Fiscal year 1927: Amount specified in appropriation acts.....			50,090.00

*Voucher transactions*

	Reclama- tion fund	Wind River ceded lands (Indian)	Increase of com- pensation (net)	Total
Disbursements and net transfers.....	\$3,022,659.37	\$359,176.04	\$45,271.60	\$3,427,107.01
Less collections.....	77,901.92			77,901.92
Net investment June 30, 1926.....	2,944,757.45	359,176.04	45,271.60	3,349,205.09

*Construction account*

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works, original construction .....	\$534,174.10	\$2,808,406.27
Operation and maintenance prior to public notice (net) .....	282.59	20.84
		\$2,808,427.11
Less construction revenues .....	1,438.24	6,094.69
Total to be repaid by water users .....	535,894.93	2,802,332.42

<sup>1</sup> Contra.*Status of current accounts receivable as of June 30, 1926*

	Due		Collected (cash)		Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Miscellaneous:					
Rentals of irrigation water.....	\$413.00	\$674.75	\$413.00	\$674.75	
Rentals, power and light.....	10,861.87	14,788.78	11,087.76	14,088.55	\$730.23
Other.....			14,067.21	63,168.62	2,089.72
Grand total collections.....			25,537.97	77,901.92	

**WYOMING, SHOSHONE PROJECT**

The Shoshone project is located principally in Park and Big Horn Counties, Wyo., with a small area in Carbon County, Mont. The developed portions of the project consist of the Garland division, irrigable area 42,000 acres, and the Frannie division, 20,000 acres under constructed works, undeveloped 8,000 acres. The Willwood division, with an area of 15,600 acres, is under construction. The annual rainfall for the Garland division has averaged 5.33 inches for the past 18 years, and for the Frannie division 4.99 inches over a period of 10 years. The average elevation of the project lands is 4,500 feet above sea level. Temperature records over a period of 18 years for the Garland division show an average annual maximum of 96.9° F. and an average annual minimum of -23.1° F.; for the Frannie division corresponding figures over a 10-year period are 101.5° F. and -27.8° F. The principal agricultural products are alfalfa, wheat, oats, potatoes, sugar beets, beans, and seed peas. The principal markets are Billings and Butte, Mont.; Casper, Wyo; Omaha, Nebr.; and Kansas City, Mo.

*Operation and settlement data, Shoshone project*

Item	1921	1922	1923	1924	1925
Acreage for which bureau is prepared to furnish water.	65,826	71,223	70,350	63,240	62,000
Acreage irrigated	45,420	42,570	38,650	36,510	36,700
Miles of canal operated	460	457	452	450	448
Water diverted (acre-feet)	221,419	192,851	176,198	175,873	194,422
Water delivered to land (acre-feet)	112,324	90,170	91,082	89,036	96,207
Per acre of land irrigated (acre-feet)	2.47	2.33	2.36	2.44	2.62
Total number of farms on project	1,005	1,083	1,071	1,071	1,056
Population	2,686	2,444	2,025	1,969	1,997
Number of irrigated farms	935	914	838	820	816
Operated by owners or managers	646	696	426	564	405
Operated by tenants	289	218	412	236	411
Population	2,686	2,444	2,025	1,969	1,997
Number of towns	5	5	5	5	5
Population	1,541	1,585	1,705	1,400	1,258
Total population of towns and farms	4,227	4,029	3,730	3,369	3,255
Number of public schools	7	7	7	7	7
Number of churches	8	8	8	8	8
Number of banks	5	4	3	3	3
Total capital stock	\$110,000	\$100,000	\$85,000	\$85,000	\$85,000
Amount of deposits	\$543,000	\$441,000	\$468,000	\$366,000	\$481,000
Number of depositors	2,400	2,400	2,300	1,473	2,100

<sup>1</sup> Does not include Powell National Bank salvage fund of \$85,000 nor its depositors.

*Appropriations*

<b>Fiscal year 1926:</b>	
Congressional authorizations	\$380,000.00
Disbursements	\$124,999.56
Liabilities outstanding	11,372.82
Unencumbered balance June 30, 1926	136,372.38
<b>Fiscal year 1927: Amount specified in appropriation acts</b>	243,627.62
	278,000.00

*Voucher transactions*

	Reclamation fund	Judgments, Court of Claims	Increase of compensation (net)	Total
Disbursements and net transfers	\$9,853,714.20	\$322,164.67	\$164,135.50	\$10,340,014.37
Less collections	1,485,373.55			1,485,373.55
Net investment June 30, 1926	8,368,340.65	322,164.67	164,135.50	8,854,640.82

*Construction account*

	Fiscal year 1926	To June 30, 1926
<b>Cost of irrigation works:</b>		
Original construction	\$93,720.78	\$7,672,717.37
Supplemental construction	21,641.88	1,671,641.13
Total construction cost	115,371.66	\$9,344,258.50
Operation and maintenance prior to public notice (net)		21,398.67
Operation and maintenance deficits and arrearages to be repaid with construction	<sup>1</sup> 1,921.16	42,985.87
		9,408,643.04
<b>Less:</b>		
Contributed funds		1,900.00
Construction revenues	39,152.08	122,852.49
		124,752.49
Total to be repaid by water users	74,298.42	9,283,890.55
Contracted repayments: Water-right contracts (individuals)	<sup>1</sup> 604,241.41	5,161,608.30

<sup>1</sup> Contra.

## Operation and maintenance account

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$61,381.07	\$776,889.00	\$57,066.26	\$811,548.84
Operation and maintenance returns:				
Contracted.....	27,035.31	698,554.18	22,256.56	691,188.73
Penalties.....	16,785.97	27,370.35	16,656.79	28,036.72
Discounts (contra).....	567.37	11,212.07	288.24	11,055.98
Miscellaneous revenues.....	8,937.14	32,067.36	9,041.82	37,426.46
Subtotals.....	52,191.05	746,799.82	47,598.93	745,587.98
Other credits: Operation and maintenance deficits and arrearages to be repaid with construction.....	1,747.99	43,159.04	1,921.16	42,968.67
Total.....	50,443.06	789,958.86	45,647.77	788,573.80
Results:				
Excess.....		13,069.86		
Deficit.....	10,938.01		11,418.49	22,975.94

<sup>1</sup> Contra.

## Status of current accounts receivable as of June 30, 1926

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Water-right charges.....	\$78,698.69	\$1,045,710.14	\$10,306.19	\$639,263.11	\$103.92	\$2,528.58	\$403,918.45
Contributed funds.....		1,900.00		1,900.00			
Total.....	78,698.69	1,047,610.14	10,306.19	641,163.11	103.92	2,528.58	403,918.45
Charges paid in advance.....			\$ 358.06	226.93			
Refunds.....			15,959.15	20,483.78			
Operation and maintenance:							
Water-right charges, project lands (57,333.61 acres).....	\$ 22,258.56	691,188.73	32,717.42	471,810.67	559.91	20,261.26	199,116.80
Penalties and interest.....	16,656.79	28,036.72	1,756.16	10,483.43	32.41	2,685.07	14,966.22
Charges paid in advance.....			\$ 36.37	325.12	\$ 11.08	16.53	
Refunds.....				1,078.90		156.69	
Miscellaneous:							
Rentals of irrigation water.....	8,539.98	33,967.67	8,088.92	33,247.92		55.92	663.63
Rentals, power and light.....	11,660.63	35,750.88	11,316.11	34,646.38		16.00	1,089.60
Rentals, grazing and farming lands.....	1,038.80	11,666.91	1,038.80	11,435.91			231.00
Construction forfei- tures.....			7,359.26	17,190.54			
Construction penalties and interest.....	30,168.84	40,067.81	5,875.35	15,774.32			24,292.49
Other.....			7,858.90	227,507.54			3,456.53
Grand total collec- tions.....			101,881.83	1,485,373.65			

<sup>1</sup> Actual construction accruals for year..... \$116,699.61  
Reduction due to relief and cancellations..... 27,910.92

Net accruals..... 78,698.69

<sup>1</sup> Contra.

<sup>1</sup> Actual operation and maintenance accruals for year..... 49,796.99  
Reduction due to relief and cancellations..... 27,538.43

Net accruals..... 22,256.56

NOTE.—Uncollected construction water-right charges as of June 30, 1926, 38.6 per cent of total accruals.  
Uncollected operation and maintenance charges as of June 30, 1926, 28.8 per cent of total accruals.

## SECONDARY INVESTIGATIONS

Funds for the investigation of prospective projects and kindred work are derived from appropriations by Congress, from contributions by States and other organizations for expenditure by and through the Bureau of Reclamation, and by direct payment by States to personnel operating under the direction of the bureau. In addition, much work is often done by other agencies independent of the bureau with expenditures not reported. Federal funds for the work in the past year were from the acts of June 5, 1924, December 5, 1924, and March 3, 1925. A special fund of \$10,000 was also appropriated by act of March 3, 1925, for investigation of the eastern tributaries of Milk River in Montana. The total cost of investigations during the past year was approximately \$116,000, of which about \$74,000 was provided by the United States. Details of costs will be found in the financial section.

### ARIZONA

#### COLORADO RIVER

The work on this investigation has been limited to participation by the bureau with the Federal Power Commission and others in the operation and maintenance of the Bright Angel gaging station on Colorado River.

A draft of a bill introduced in the Senate and House of Representatives providing for the development of the Lower Colorado River Basin was submitted to the Secretary of the Interior, and after extensive hearings a bill conforming in all particulars to his recommendations has been favorably reported in the Senate. As a result of this the Secretary, accompanied by the Commissioner of Reclamation, visited the Boulder Canyon during the latter part of April, 1926. Investigations have been resumed to gather additional data on the extension of irrigation in the Lower Colorado River Basin.

### CALIFORNIA

#### SACRAMENTO VALLEY INVESTIGATIONS

The investigation was continued under contract of January 26, 1924, with the State of California Department of Public Works and the Sacramento Valley Development Association.

*Iron Canyon project.*—Field work was completed early in the year and draft of report prepared. This report is now under review and will be completed in the near future.

*Salt water barrier.*—Drilling was completed at the San Pablo dam site, the last to be tested. Numerous observations were made of tidal velocities and levels, and salinity was determined under varying conditions in the tidal area for a study of the hydraulics of the bay and the lower river systems of Sacramento and San Joaquin Rivers. Shipping density and character were determined by investigation of available data and by independent observations. A board of engineers was convened in January, 1926, for determination of the general plans to be given further consideration. Designs and estimates are under preparation of 16 alternative plans for a dam, at the Army Point, Benicia, Dillon Point, and Point San Pablo sites, the variations involving principally different types of bridges and varying provisions for shipping.

By a contract dated March 16, 1926, the California Development Association contributed \$4,457 to offset an additional \$1,600 supplied by the United States for continuation of the investigations. The report will probably be completed early in the next fiscal year.

#### DEER-BUTTE CREEK INVESTIGATIONS (CHICO PROJECT)

Surveys of the distribution system were completed and designs and estimates of the reservoir dams prepared in the Denver office. A report was made in November, 1925, and with a revision of project costs by a board of review,

approved by the commissioner. A project with storage at Butte Creek Reservoir site, with an irrigable area of 30,000 acres, is estimated to cost \$179 per acre without monetary allowance for use of waters brought to Butte Creek from North Fork of Feather River by a power company for power purposes. With storage at Deer Creek Meadows a project of 25,000 acres would cost \$126 per acre, while a supplemental storage supply would be furnished 8,000 acres of developed lands at an estimated cost for storage alone of \$20 per acre. Material modification of these costs might result when the prior rights to water are fully established, the lack of adjudications and confusion of water rights from the uncertainties of riparian rights not permitting an exact determination of water supply under existing conditions.

## COLORADO

### HUERFANO PROJECT

At the request of owners of lands under canals diverting from Huerfano River in the lower 20 miles of its course, a reconnaissance was undertaken to determine the feasibility of providing storage for a supplementary water supply. A report was made on April 28, 1926. The most feasible storage site is located on Huerfano River a short distance above the mouth of Chuchas River, where a reservoir with a capacity of 13,000 acre-feet is estimated to cost \$400,000. Meager run-off records make it impossible at this time to prepare a reasonably accurate estimate of proper reservoir capacity and probable yield. The demand for water by first-class lands under existing canals with insufficient water supply far exceeds the supply that could be obtained from this reservoir.

### CADDOA RESERVOIR SITE

Upon request of the State Engineer of Colorado for a topographic survey of this site, a rough estimate of probable cost and water yield was prepared to determine the desirability of such survey. The site is located on Arkansas River just below Las Animas. The conclusions reached and forwarded by letter of May 9, 1926, to the commissioner were to the effect that probable cost of storage would be fully \$80 per acre-foot of yield and that the value of irrigation water did not justify such a cost for construction nor further surveys at this time.

### JOSEPHINE BASIN PROJECT

By extending the Miller Creek Ditch, diverting from White River, about 12 miles above Meeker, Colo., an irrigable area of 3,000 acres would be covered on the southerly side of White River beginning 2 miles below Meeker. Construction cost for enlargement and extension of the present canal, together with laterals and drainage, is estimated at \$143 per acre. At the present time improved irrigated lands in the vicinity are selling at \$100 to \$125 per acre. A report on this project was dated August, 1925.

## IDAHO

### DUBOIS PROJECT

During the spring freshet season of 1926, measurements were made of Sheridan, Willow, Icehouse, and Hotel Creeks for the determination of stream flow that might be diverted from Shotgun Valley to Camas Creek. Estimates of construction cost for this plan and for diversions from Henry Fork and South Fork of Snake River for the irrigation of lands west for Dubois were in progress. Difficult country must be traversed with any canal lines that can supply these lands, requiring heavy expenditures for a location survey and a detailed report. A report covering the work done in recent years will be completed soon.

### GOODING PROJECT

On June 16, 1925, contract was executed with the Big Wood Canal Co. for a cooperative investigation of the project by the United States, the company furnishing \$1,000 toward the cost, with liability of the United States limited to \$10,000. The final cost was \$6,749. A preliminary report on the engineering and economic phases of this project was made on November 25, 1925.

The irrigable lands comprise 46,664 acres in the Idaho Irrigation Co. project now receiving a partial supply from Big Wood and Little Wood Rivers, and 36,500 acres of dry lands. The former lie north and west of Shoshone, Idaho, and with the construction of this project would be divested of their present water supply in order to provide a better supply for higher lands similarly situated. The new lands lie south of Shoshone, Idaho, and adjacent to the North Side Twin Falls project. Diversion would be made at Milner dam on Snake River of unappropriated waters of that stream and of American Falls storage waters to be purchased. Construction cost, including purchase of storage, is estimated at \$84 per acre for the new lands and \$62 per acre for the old lands.

While construction would not be difficult, the canal system, as well as all of the irrigable lands, are in a lava country and final estimates of cost and irrigable area would require several times the amount expended in this investigation.

#### NEELEY PROJECT

Investigation of the feasibility of irrigating 1,500 to 2,000 acres of land south-east of and adjacent to the American Falls dam has been undertaken at the request of the American Falls Chamber of Commerce and other interested parties with funds from bureau appropriations. The landowners have already paid for the installation of an outlet from the reservoir to provide an irrigation supply for these lands. Detailed topography has been obtained of the lands and estimates of construction cost are under preparation. Water will have to be pumped approximately 135 feet.

#### EMPIRE IRRIGATION DISTRICT

At the initiation of the construction of American Falls Reservoir, the Empire irrigation district subscribed for 110,000 acre-feet of storage, but failed to make the payments contracted. A brief examination of this project was made, with report thereon on September 19, 1925.

The district comprises about 43,000 acres of irrigable land around Bancroft and Soda Springs, Idaho, which it is proposed to irrigate largely by diversions from Blackfoot River above and below the Blackfoot Reservoir. From this examination it was concluded that the construction cost of the system would be very materially in excess of anticipated costs at the time the district was organized. In view of the lack of interest in construction, the subscription for storage has been canceled for nonpayment of charges due.

#### BOISE PROJECT—PAYETTE DIVISION

This division comprises lands formerly in the Black Canyon division and not now irrigated by the Notus Canal. Further investigation of the proposed Little Payette Lake Reservoir site led to the conclusion that it is not adapted to an increase in capacity over that being provided by the Lakefork irrigation district. A report on all known reservoir sites usable for the Payette division was made in January, 1926. Topographic mapping of Payette division lands was resumed and classification thereof by 40-acre tracts commenced with completion of both anticipated early in the coming year.

### MONTANA

#### EASTERN TRIBUTARIES OF MILK RIVER

Irrigation possibilities of each stream crossing the Canadian boundary were investigated, data for lands in the United States being obtained from past investigations by the United States and private parties and from additional brief surveys. Data on Canadian possibilities were supplied by Canadian irrigation officials. The conclusions from this investigation were that the present equal division of the individual streams should, in general, be maintained with allotment of the higher flood flows of Battle, Whitewater, and Rock Creeks to the United States and of Frenchman Creek to Canada. A conference at Calgary, Canada, on April 2 and 3, 1926, with Canadian irrigation officials, indicated that the proposed division of waters was not satisfactory to them, while a counter proposal by the Canadians was found to be unsuited to the requirements of United States irrigation. With this conference all work was suspended.



## FLATHEAD PROJECT POWER DEVELOPMENT

At the request and expense of the Indian Bureau, now operating the Flathead project, a study was made of the utilization of the uncompleted Newell tunnel,  $4\frac{1}{2}$  miles below Flathead Lake on Flathead River, for power production. Plans and estimates were prepared and submitted in November, 1925, for development with and without a low diversion dam at the head of the tunnel and in each case without storage regulation of Flathead Lake.

## NEW MEXICO

## PECOS RIVER INVESTIGATIONS

*Hydrometric surveys.*—Measurements of stream flow of the Pecos River from Guadalupe to Acme were continued under contract with the State of New Mexico, dated May 18, 1925, to the end of November. A report was submitted on June 5, 1926. As the result of inspection of the stream bed and banks in the section named and a study of the stream flow records, it was concluded that seepage losses from Pecos River between the Alamogordo Reservoir site and Acme are negligible and that the total loss can be accounted for by evaporation. There are no indications of leakage from the channel, as is occurring from McMillan Reservoir through soluble gypsum and cavernous limestone foundations.

*No. 3 reservoir site.*—Contract between the United States and the Pecos Water Users' Association was entered into on June 27, 1925, for a cooperative financing of a geological investigation of the No. 3 reservoir site by the Geological Survey, with funds to be supplied equally by the two parties to the contract. Four test wells were drilled, under instructions from the Geological Survey, to an aggregate depth of 590 feet, and tested for water leakage and inflow. The entire vicinity was geologized with report of O. E. Meinzer, B. C. Rennick, and K. Bryan, dated January, 1926. The conclusions reached by these geologists were that the risk of leakage from the No. 3 reservoir site is too great to warrant the construction of a dam to impound waters to a sufficient level for material storage capacity and that this reservoir site should not receive further consideration.

On May 10, 1926, a contract was executed between the United States, the Pecos Water Users' Association, and the Fort Sumner irrigation district providing for an engineering board of three members, one to be appointed by the Secretary of the Interior, one by the Commissioner of the Bureau of Reclamation, and one by the association and district jointly for a review of Pecos River conditions and storage needs at a total cost not exceeding \$10,000, to be provided equally by the United States and the other parties jointly. This board has not yet been selected.

## MIDDLE RIO GRANDE VALLEY

On April 16, 1926, contract was made between the United States and the Middle Rio Grande conservancy district, of Albuquerque, N. Mex., for cooperative investigations of problems related to water supply and silt control at a maximum cost of \$25,000, to be provided equally by the parties to the contract.

The conservancy district comprises the Rio Grande Valley from San Felipe to San Marcial, together with adjacent areas, a total of over 200,000 acres, of which some 135,000 acres are considered irrigable. It is proposed by the district to construct works for irrigation, drainage, and flood control, with cost thereof to be assessed against all property in and adjacent to the valley on the basis of anticipated benefits.

United States interests are involved through ownership of the works of the Rio Grande project, including Elephant Butte Reservoir, and through its guardianship of Indian interests throughout the valley. The direct interests of the Rio Grande project are limited to the effect on its water supply and the modification of present silt inflow conditions at the reservoir, and the cooperative studies will be confined to these subjects. Field work by the bureau was initiated near the close of the fiscal year.

## NORTH DAKOTA

At the request of interested parties in North Dakota, a review of the Heart River, Bowman, and other North Dakota projects has been undertaken to determine in what way, if any, conditions governing feasibility have been changed since previous investigations were made from 1904 to 1909. These projects will be found described in the twentieth and earlier annual reports of the bureau.

## OREGON-CALIFORNIA

## LOWER KLAMATH LAKE

The agricultural board described in the last annual report made a report on September 2, 1925. In general the conclusions were that the peat lands, largely in Oregon and contained within the limits of the Klamath drainage district, are under development with reasonable assurance of success, but that attempts in the reclamation of the lake bed will probably end in failure. Alkali was found to be present everywhere with danger of surface concentration and the appearance of black alkali unless irrigation and drainage be intelligently coordinated. This board recommended that the lake bed proper be reflooded with drainage waters from the surrounding peat lands together with such additional inflow from Klamath River as may be necessary to maintain a lake for the benefit of bird life. The consummation of this plan would require a dike across the lake to protect the lands destined for cultivation together with the installation and operation of pumps to maintain the desired ground water level in the cultivated areas. There is at present no provision for financing such requirements.

## OREGON

## HARNEY PROJECT

Field investigations of engineering and economic matters have been under way and nearly completed. The irrigation distribution system is unusually simple and low in estimated cost. Drainage requirements are difficult to determine in advance but will probably approximate average costs. Storage will be the dominant feature of required works. Ample areas of good soil are available for the efficient use of all available water supply.

## DESCHUTES PROJECT

Contract between the United States and the State of Oregon was made on June 22, 1925, for further investigation of the Deschutes project, the cost thereof up to \$1,500 to be borne by the United States and one-half of any additional expenditure to be paid by the State to the United States, with all work to be done by the Bureau of Reclamation. In view of the extensive engineering data available from past investigations by the United States, the State, and other agencies, the present investigations were largely confined to economics and soil classification.

The report, dated February 19, 1926, concludes that the water supply is ample for a project of 80,000 acres; that soil averages 2 feet in depth and appears to be of better quality than near-by developed lands; that an average acre crop return of \$30 may be expected; that marketing conditions are favorable; and that construction costs would be \$95 per acre or more. Additional engineering investigations and soil surveys will be required for a final estimate of construction cost and determination of irrigable area.

## UMATILLA EXTENSIONS

An investigation of the economic phases of the utilization of McKay storage was made by a board consisting of G. R. Hyslop of the Oregon Agricultural College and E. R. Crocker and H. H. Johnson of the Bureau of Reclamation, with report dated July 14, 1925. The conclusions drawn by this board are that the development of the Westland extension, Teel and Paradise projects for the use of McKay Creek storage is not feasible on account of excessive construction cost; the Westland extension having the further disadvantage of poor soil and low duty of water and the Paradise project landowners not being sufficiently interested. The use of McKay storage on the Judson unit (a part of the west extension division of the Umatilla project) should be deferred pending development of return flow in Umatilla River from the use of McKay storage on lands above; that the Westland district has contracted for sufficient McKay storage for its development; that the Stanfield irrigation district will require 28,517 acre-feet of storage instead of 13,517 acre-feet already contracted for, and that this district can pay only \$4 to \$4.50 per acre per year toward construction charges; that the most feasible area for use of available McKay storage would be an extension of the Stanfield irrigation district which is, however, infeasible,

except by inclusion with the district and by an enlargement of its canals; that no extension of farmed areas should be attempted until better means of financing construction of irrigation works and development of farms are provided.

#### UMATILLA RAPIDS

A study of the soils, land classification, and economic features has been under way during the year, special attention being given to possibilities of the use of power that can be produced at the dam in excess of irrigation pumping requirements. The present power-consuming centers of Washington and Oregon are fully supplied with power and their growth in power needs can be met by developments more favorable than Umatilla Rapids. Furthermore, the surplus power over irrigation needs at the Umatilla Rapids site will be seasonal to a large degree. Under these conditions, the principal market for surplus power must be chemical and metallurgical industries, of which a special study is being made.

#### UTAH

##### CASTLE PEAK PROJECT

In cooperation with the United States Geological Survey, a gaging station has been maintained near Tabiona on Duchesne River.

##### GREAT SALT LAKE BASIN INVESTIGATIONS

The investigations in the Great Salt Lake Basin are conducted in cooperation with the Utah Water Storage Commission, the initial contract being dated January 3, 1922, with numerous supplemental contracts for continuation thereof and extension of the field covered thereby, at a total cost, to June 30, 1926, of about \$126,000.

##### CACHE VALLEY INVESTIGATIONS

At the request of the Cache County Water Users' Association, a topographic survey, water supply study, and cost estimate was prepared for the Paradise Reservoir site on Little Bear River with the object of irrigating an area of about 6,500 acres on Sterling Bench. With dams raising water 80 and 90 feet, the reservoir capacities provided would be 8,000 and 10,000 acre feet respectively, with an estimated cost in each case of \$85 per acre foot of capacity. Consideration was also given to the alternative use of Porcupine Reservoir site.

The Hyrum Reservoir site on Little Bear River is described in the September, 1924, report on Cache Valley investigations with recommendation that the site be thoroughly tested. In the past year the dam site was tested by means of a well drill with an aggregate depth for all holes of 838 feet and open pits with an aggregate depth of 162 feet. Additional topography has also been obtained of this site, together with a classification of lands required for right of way purposes. A report on utilization of this reservoir is in progress.

##### DIAMOND FORK POWER INVESTIGATIONS

This work was authorized by letter of the Utah Water Storage Commission dated August 21, 1925, with funds from the general fund for Salt Lake Basin investigations and a maximum expenditure of \$5,000. This project proposes the diversion from Sixth Water Creek immediately below the tunnel outlet of Strawberry Reservoir of available natural flow and storage in transit for the Strawberry Valley project with return thereof to the same stream about 5 miles below, where a head of 830 feet is available. A study of the water supply for this project, preparation of plans and estimates, and study of power utilization are now under way.

##### PROVO RIVER INVESTIGATIONS

Investigation of the Deer Creek reservoir and dam site has been continued. Unsatisfactory foundation conditions at dam sites at the mouth of Deer Creek have led to the testing of other sites. During the year 1,227 feet of diamond drilling, 73 feet of open tunnel, and 1,881 feet of open pits were provided to develop foundation conditions. A geological examination was made by Prof F. J. Pack of the University of Utah. The Denver & Rio Grande Railroad branch to Heber will require reconstruction for a distance of about 10 miles to be located

above the high-water line of the proposed reservoir, and nearly an equal amount of improved highways would require replacement. Detailed topography for such changes has been obtained for a basis of cost estimates. Designs and estimates are under preparation for the two most favorable locations for the dam. Water supply studies have been revised to fit changed conditions on Weber River diversions and to bring past studies to date. A full report on Provo River investigations is expected to be finished in the near future.

#### UTAH LAKE CONTROL

Throughout the year the problem of revision of the present agreement for regulation of levels of Utah Lake has been under discussion by representatives of the canal companies receiving water from Utah Lake, owners of marginal lands around Utah Lake, Bureau of Reclamation engineers, and the State engineer. No tangible results have so far been achieved. The Taylorville and Terminal area of 70,000 acres west of Salt Lake City and south of Great Salt Lake was classified for irrigability by A. T. Strahorn and W. G. Harper of the Bureau of Soils, Department of Agriculture, with report dated December 19, 1925.

A land classification and economic report on the reclamation of marginal lands around Utah Lake either seeped or threatened with seepage and inundation through high levels in Utah Lake is under preparation. Soil tests for use in this report have been made by the Utah Agricultural College of Logan, Utah. Plans and estimates are being prepared for a pumping plant and canals for the Provo Bay reclamation project for the dual purpose of pumping drainage water into Utah Lake and into a supply canal for this area to obviate or reduce the storage needed from outside sources.

#### WASHINGTON

##### COLUMBIA BASIN INVESTIGATIONS

Several conferences were held during the year by representatives of Montana, Idaho, and Washington for the discussion of the terms of a compact for the allocation of Columbia River waters with a view of assuring a water supply for this project. A representative of the Bureau of Reclamation was present at these conferences in an advisory capacity.

##### YAKIMA PROJECT EXTENSIONS

Contracts between the United States and the Yakima irrigation district (Moxee division) dated May 25, 1925; the Kennewick irrigation district (Kennewick division), dated May 28, 1925; and the Yakima-Benton irrigation district (Roza division), dated May 29, 1925, provided for an aggregate expenditure of \$20,000 on soil surveys, land classification, and economic surveys to determine the feasibility of these extensions, with funds to be provided equally by the United States and the districts. The soil investigations and land classification are now being conducted by representatives of the Bureau of Soils with such engineering assistance as is required being supplied by the Bureau of Reclamation.

##### OKANOGAN-METHOW RIVER INVESTIGATION

The repeated serious shortages in water supply for the Okanogan project have prompted numerous investigations for a supplemental supply. The most promising source for any extensive water supply is the Methow River.

A contract of the United States with the Okanogan irrigation district, dated August 4, 1925, provided for an investigation of a diversion from Methow River by means of an open canal in lieu of the tunnel scheme investigated some years ago. The engineering and economic reports were made in April, 1926. The proposed canal would divert from Methow River 4 miles above Twisp, Wash., and with a length of 88 miles would reach Salmon Creek just above the diversion for the Okanogan project. Although no unusually difficult construction is encountered, almost all of the canal line would be on steep rocky slopes with a high cost for a type of construction that will not result in burdensome costs for operation and maintenance. The gross area under the canal would be 66,200 acres, of which 26,000 acres are considered suitable for fruit growing, apples being the principal crop in this locality. For such area the natural flow of Me-

thow River, augmented by existing storage facilities in use by lands commanded by the canal, would furnish an adequate water supply, provided the power right of the Washington Water Power Co. be extinguished. This right was formerly utilized near Pateros by a plant, since burned and not rebuilt. The attitude of the power company is favorable to adjustment of this matter. The construction cost is estimated at an average of \$465 per acre of irrigable lands. The cost of developing a bearing orchard is estimated at \$600 per acre. It is estimated that the development of a safe water supply and the building up of bearing orchards would add approximately \$800 per acre to the present value of non-irrigated lands. Preliminary plans and estimates have been prepared for a pumping plant of 40 second-foot capacity at the Shell Rock site to deliver Okanogan River water into the high line canal below the drop and of a power plant of 4,500 Kw-a. output at McLaughlin Rapids on Okanogan River to furnish power for the above pumping plant and for existing pumping plants on the project. As an auxiliary water supply for the present project area, a pumped water supply from Okanogan River would cost less than water from Methow River.

## WYOMING

### SARATOGA PROJECT

Operations have been carried on under contract with the State of Wyoming dated March 30, 1925. The field work and most of the office work on the soil survey and land classification undertaken in cooperation with the State of Wyoming is practically complete. Report thereon will be completed at an early date. In general the findings are expected to confirm the estimates of irrigable area used in the engineering report of July, 1922.

### NORTH PLATTE PUMPING UNITS

Investigations were continued under contract with the State of Wyoming dated March 30, 1925. Topography was taken of all undeveloped irrigable lands within practicable pumping lift of the North Platte River from Glenrock to Guernsey Reservoir. A soil survey and land classification has been completed as to field work. Plans and estimates of construction cost are in course of preparation. A report on these operations is being compiled at the close of the fiscal year.

## EXPERIMENTAL INVESTIGATIONS

Observations previously started for stress determinations at Clear Creek and Gerber Dams were continued, the results being forwarded to the Engineering Foundation Committee of the American Society of Civil Engineers on arched dams, for analysis. The bureau was represented at two meetings of the Arched Dam Committee at Fresno, Calif.

A field investigation was made of flow conditions in the King Hill main canal, with special reference to transition losses and "air trouble" in siphons. The data thus obtained were made the subject of a special report and augmented by other available information were later used in the preparation of a paper which it is proposed to submit to the American Society of Civil Engineers for publication. Data cards covering the principal points were also prepared and publication is now pending.

Hydrometric data are being obtained on several operating projects by measurement of the inflow to and outflow from selected areas to permit a future analysis of the duty of water with a view of determining consumptive use.

## SECONDARY PROJECT INVESTIGATIONS

### Appropriations

Fiscal year 1926:		
Congressional authorizations.....		\$80,457.50
Disbursements.....	\$44,669.01	
Liabilities outstanding.....	1,940.76	
		46,609.77
Unencumbered balance, June 30, 1926.....		22,847.73
Fiscal year 1927: Amount specified in appropriation acts.....		75,000.00

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$2,230,696.30	\$39,810.88	\$2,270,709.18
Less collections.....	713,988.86		713,988.86
Net investment, June 30, 1926.....	1,516,909.44	29,810.88	1,556,720.32

*Status of current accounts receivable as of June 30, 1926*

	Due		Collected				Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Miscellaneous:							
Contributed funds—							
Baker.....		\$5,000.00		\$5,000.00			
Other secondary in- vestigations.....	\$36,638.83	532,447.44	\$36,638.83	660,576.90			\$31,870.54
Rentals, grazing, and farm- ing land.....	17,855.88	182,778.14	17,832.41	189,836.20		\$42,497.67	444.27
Miscellaneous.....	13,642.65	68,630.76	13,587.65	68,575.76			80.00
Grand total collections.....			58,068.89	713,988.86			

<sup>1</sup> \$7,344.42 transferred to Kittitas division, Yakima project. Actual accruals for year, \$15,200.30; collections, \$15,176.88.

## GENERAL INVESTIGATIONS, RECLAMATION SERVICE, 1923-DECEMBER 31, 1924

*Appropriations*

	General investigation fund, fiscal year 1924-25	Reclamation fund
Congressional authorizations.....	\$315,213.45	\$26,103.30
Less disbursements and liabilities outstanding.....	306,455.34	25,443.24
Unencumbered balance, June 30, 1926.....	8,758.11	660.06

*Voucher transactions*

	General investigations fund	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$267,428.88	\$25,435.12	\$5,115.61	\$297,974.61
Less collections.....	35,299.42	26,108.30		61,407.72
Net investment, June 30, 1926.....	232,129.46	1,668.18	5,115.61	238,571.89

<sup>1</sup> Contra.

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*Status of current accounts receivable as of June 30, 1926*

	Due		Collected (cash)	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
Contributed funds .....		\$28,314.63		\$28,314.63
Other .....		33,088.09		33,088.09
Grand total collections .....		61,402.72		61,402.72

*Cost of investigations and funds contributed for these investigations*

Features	Fiscal year 1926	To June 30, 1926	Contributed funds
Arizona-Nevada-Utah: Colorado River tributaries .....		\$4,966.06	
California:			
Sacramento Valley, salt-water barrier .....	\$2,958.78	27,141.19	\$8,108.30
Iron Canyon .....		7,962.62	2,500.00
Colorado:			
Badito .....		585.74	
San Luis Valley .....		3,291.78	
Colorado-New Mexico: San Juan Basin .....		9,747.50	2,321.16
Idaho: Black Canyon .....		10,143.30	
Nebraska: Tri-County .....		10,780.34	5,390.17
New Mexico: Estancia Valley .....		215.81	
New Mexico-Texas: Pecos Valley Compact .....		4,524.37	
Oregon:			
Vale .....		5,792.06	
Owyhee .....		9,684.14	
Oregon-Washington: Umatilla Rapids .....		58,926.40	10,000.00
Texas: Red Bluff Reservoir .....		6,906.13	
Washington:			
Columbia Basin .....	12.54	96,876.64	
Yakima extensions <sup>1</sup> .....	132,926.09		
Total .....	129,908.85	257,698.56	28,314.63

<sup>1</sup> Contra.<sup>2</sup> Transferred to Kittitas division, Yakima project.





## Statement of costs incurred on investigations made by the Bureau of Reclamation to June

[Features active during fiscal year (for detail costs of inactive

State and project or investigation	Contractor (cooperative work)	Date of agreement	Costs during fiscal year 1926	Total costs, all parties, to June 30, 1926	
				Cooperative work	
				United States	Contractor
Arizona-California:					
Boulder Canyon.....	Imperial Irrigation district.....	Jan. 27, 1921	\$1,642.83	\$35,000.00	\$141,000.00
		Dec. 20, 1921			
	Coachella Valley district.....	Dec. 14, 1920			
	Palo Verde Levee district.....	Nov. 17, 1921			
	City of Los Angeles.....	Informal.			
	City of Pasadena.....	Feb. 16, 1922			
		May 31, 1922			
California:					
Chico (Deer-Butte Creek).....	Chico Chamber of Commerce.....	Dec. 11, 1924	4,243.01	3,500.33	3,500.33
Sacramento Valley—Iron Canyon.....	Sacramento Valley Development Association and State of California.....	Jan. 26, 1924	400.99	5,863.61	4,127.99
Salt Water Barrier.....	do.....	do.....	21,933.19	35,000.00	7,569.09 27,042.85 609.35 1,907.83
	State of California.....	June 26, 1924			
	do.....	Mar. 3, 1925			
	East Bay Mun. Ut. District.....	Sept. 19, 1924			
	California Development Association.....	Mar. 16, 1926			
Colorado:					
Huerfano.....	Noncooperative.....		366.28		
Idaho:					
Dubois.....	Dubois Project Finance Association.....	June 15, 1922	2,510.29	4,055.53	4,055.53
Gooding (Snake River).....	Big Wood Canal Co.....	June 16, 1925	6,749.21	5,749.21	1,000.00
Neeley.....	Noncooperative.....		1,981.81		
Montana:					
Milk River tributaries.....	do.....		4,554.98		
New Mexico:					
Middle Rio Grande.....	Middle Rio Grande Conservancy district.....	Apr. 16, 1926	508.34	251.67	251.67
Carlsbad extensions (third reservoir).....	Pecos Water Users' Association.....	June 16, 1925	4,632.27	2,000.00	2,000.00
Pecos Valley.....	State of New Mexico.....	May 18, 1925	2,718.57	1,988.94	1,385.11
North Dakota:					
Heart River.....	Noncooperative.....		60.20		
Oregon:					
Deschutes.....	State of Oregon.....	June 22, 1925	1,913.26	1,706.63	206.63
Harney.....	Harney Valley irrigation district.....	June 4, 1925	2,987.96	2,987.96	
Owyhee.....	Noncooperative.....		349.80		
McKay Creek Storage.....	do.....		783.24		
Lower Klamath Lake.....	do.....		338.99		
Umatilla Rapids.....	State of Oregon.....	Apr. 15, 1924	2,111.77	48,926.40	10,000.00
Utah:					
Castle Peak.....	State of Utah and Mormon Church.....	Mar. 11, 1918	67.00	999.45	999.45
Salt Lake Basin.....	State of Utah.....	Jan. 3, 1922	30,338.60	56,942.34	55,942.34
		June 1, 1922			
		Nov. 30, 1922			
		July 31, 1924			
		Apr. 30, 1925			
Cache Valley.....	do.....	June 19, 1925	4,458.88	5,000.00	7,947.85
		June 1, 1926			
		Dec. 10, 1925			

tion with funds appropriated for secondary projects and general investigations  
30, 1926

features, see twenty-fourth annual report, pp. 116-125]

Total cost, all parties, to June 30, 1926		Engineer in charge fiscal year 1926	Date of last report and author	Remarks pertaining to work during fiscal year
Nonco-operative, United States	Total			
\$151,408.11	\$327,808.11	-----	June, 1924; Weymouth.	Stream gaging at Bright Angel station.
-----	7,000.65	Fisher-----	November, 1925; Fisher.	-----
-----	9,990.61	Young-----	May, 1920; Gault.	\$1,627,000 expended by State.
-----	71,453.98	Young-----	-----	Work in progress.
366.28	366.28	Debler-----	April, 1926; Debler.	-----
28,967.83	37,078.89	Debler and Banks.	Jan. 12, 1909; Gay.	Field hydrography on Shotgun Valley streams, and office estimates.
-----	6,749.21	Gault-----	November, 1925; Gault.	-----
1,981.81	1,981.81	Whittemore-----	-----	Work in progress.
5,018.72	5,018.72	Crocker-----	Mar. 11, 1926; Crocker.	-----
-----	503.34	Houk-----	March, 1923 Gault.	\$5,000 advanced by contractor.
632.27	4,632.27	Meinzer, Renick and Bryan.	January, 1926	Geological examination by Geological Survey.
-----	3,377.05	Elder-----	January, 1926; Elder.	State contracted to expend not to exceed \$2,000. Hydrographic investigations on Pecos River.
60.20	60.20	Stratton-----	January, 1909; Stebbins.	Work in progress.
-----	1,913.26	Weiss-----	February, 1926; Weiss.	State advanced \$681.01.
-----	2,987.96	Bond and Hayden.	February, 1916; Whistler.	Engineering and economic reports in progress.
28,055.06	28,055.06	Newell-----	January, 1925; Bond.	Geological report on reservoir by Kirk Bryan, Geological Survey, made December, 1925.
8,018.53	8,018.53	-----	June, 1925; Crocker.	Allocation of storage. Work in progress.
360.47	360.47	Kreutzer-----	September, 1925; Lapham, Powers, and Shaw.	Board review of agricultural conditions.
2,111.77	61,038.17	Weiss-----	October, 1924; Crocker.	Review of economics and soil classification. Work in progress.
22,968.23	24,967.13	-----	December, 1920; Drager.	Expenditures during 1926 for gaging station.
-----	112,884.68	Green-----	October, 1925; Green.	\$57,884.75 advanced by State. Work in progress.
-----	12,947.83	do-----	September, 1924; Green.	\$10,000 advanced by State. Work in progress.

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*Statement of costs incurred on investigations made by the Bureau of Reclamation to June 30,*

State and project or investigation	Contractor (cooperative work)	Date of agreement	Costs during fiscal year 1926	Total costs, all parties, to June 30, 1926	
				Cooperative work	
				United States	Contractor
Washington:					
Kittitas.....	(See remarks).....				
Yakima extensions—					
Roza division.....	Benton irrigation district....	May 29, 1925	\$1,622.12	\$811.06	\$811.06
Moxee division.....	Yakima irrigation district....	May 25, 1925	2,960.71	1,475.36	1,475.36
Kennewick division...	Kennewick irrigation district...	May 28, 1925	95.38	47.69	47.69
Okanogan pumping....	Noncooperative.....		185.28		
Columbia Basin.....	do.....		<sup>1</sup> 2.54		
Wyoming:					
North Platte River pumping.	State of Wyoming.....	Mar. 30, 1925	6,365.68	4,267.27	2,097.42
Saratoga.....	do.....	do	1,602.69		1,602.69
Miscellaneous:					
Miscellaneous investigations.	Noncooperative.....		161.32		
Experimental investigations.	do.....		7,148.58		
Features inactive during fiscal year (for detail costs see twenty-fourth annual report, pp. 116-126).				261,552.19	413,623.63
Subtotal.....			115,770.69	478,145.64	690,430.70
Less costs transferred to Kittitas division, Yakima project.....			101,082.73		1,009.09
Grand total.....			14,687.96	478,145.64	690,430.70

<sup>1</sup> Contra.

tion with funds appropriated for secondary projects and general investigations  
1926—Continued

Total costs, all parties, to June 30, 1926		Engineer in charge fiscal year 1926	Date of last report and author	Remarks pertaining to work during fiscal year
Nonco-operative, United States	Total			
				Transferred to Kittitas division, Yakima project.
	\$1,622.12	Lytel		Work in progress; \$5,000 advanced by contractor. Land classification.
	2,950.71	do.		Work in progress; \$2,500 advanced by contractor. Land classification.
	95.28	do.		Do.
\$185.28	185.28			Preliminary estimates by Denver office.
102,563.66	102,563.66		February, 1925; Board of Engineers.	
	8,284.70	Smith		State contracted to expend not to exceed \$5,000. Work in progress.
	1,602.66	Kreutzer	1921; Bondstedt.	State contracted to expend not to exceed \$2,500. Work by State of Wyoming on soil classification.
9,891.31	9,891.31			
36,717.80	36,717.80			
1,229,129.24	1,904,305.15			
1,628,651.67	2,797,228.01			
100,082.73	101,082.73			
1,528,568.94	2,696,145.28			

\* Includes \$191,597.10 expended directly by States and other agencies.

## BAKER PROJECT, OREGON

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$490,832.56
Disbursements.....		523.09
Unencumbered balance, June 30, 1926.....		490,518.51
Fiscal year 1927: Amount specified in appropriation acts.....		(1)

<sup>1</sup> The unexpended balance of the 1926 appropriation.

*Voucher transactions*

	Reclamation fund	Increase of compensation (net)	Total
Disbursements and net transfers.....	\$58,109.38	\$1,442.19	\$59,551.57
Less collections.....	879.29		879.29
Net investment, June 30, 1926.....	57,230.09	1,442.19	58,672.28

*Cost of investigations*

	Fiscal year 1926	To June 30, 1926
Cost of investigations.....	\$2,504.23	\$63,360.68
Less contributed funds.....		5,000.00
Net cost.....	2,504.23	\$58,360.68

## VALE PROJECT, OREGON

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$500,000.00
Disbursements.....		17,493.27
Unencumbered balance, June 30, 1926.....		482,506.73
Fiscal year 1927: Amount specified in appropriation acts.....		(1)

<sup>1</sup> The unexpended balance of the 1926 appropriation.

*Voucher transactions*

Reclamation fund:		
Disbursements and net transfers.....		\$17,544.01
Less collections.....		.33
Net investment, June 30, 1926.....		17,543.68

*Cost of investigations*

	Fiscal year 1926	To June 30, 1926
Cost of investigations <sup>1</sup> .....	\$16,545.88	\$16,545.88

<sup>1</sup> For other costs, see report for secondary projects.

## OWYHEE PROJECT, OREGON-IDAHO

*Appropriations*

Fiscal year 1926:		
Congressional authorizations.....		\$210,496.84
Disbursements.....	\$20,008.03	
Liabilities outstanding.....	28.31	
Unencumbered balance, June 30, 1926.....		20,036.84
Fiscal year 1927: Amount specified in appropriation acts.....		290,460.00
		(1)

<sup>1</sup> The unexpended balance of the 1926 appropriation.

*Voucher transactions*

Reclamation fund: Disbursements and net transfers..... \$24, 271. 41

*Cost of investigations*

	Fiscal year 1926	To June 30, 1926
Cost of investigations <sup>1</sup> .....	\$10, 628. 49	\$23, 331. 53

<sup>1</sup> For other costs, see report for secondary projects.

## SALT LAKE BASIN PROJECT, UTAH

*Appropriations*

Fiscal year 1926:		
Congressional authorisations.....		\$1, 263, 066. 75
Disbursements.....	\$31, 716. 61	
Liabilities outstanding.....	1, 466. 16	
		23, 182. 77
Unencumbered balance, June 30, 1926.....		1, 239, 883. 98
Fiscal year 1927: Amount specified in appropriation acts.....		(1)

<sup>1</sup> The unexpended balance of certain 1926 appropriations.*Voucher transactions*

Reclamation fund: Disbursements and net transfers..... \$35, 112. 71

*Cost of investigations*

	Fiscal year 1926	To June 30, 1926
Cost of investigations <sup>1</sup> .....	\$25, 086. 25	\$34, 460. 04

<sup>1</sup> For other costs, see report for secondary projects.

## NORTH DAKOTA, WILLISTON PROJECT

*Appropriations*

Fiscal year 1926:		
Congressional authorisations.....		\$25, 000. 00
Disbursements.....	\$23, 242. 79	
Liabilities outstanding.....	145. 50	
		23, 388. 29
Unencumbered balance due June 30, 1926.....		1, 611. 71
Fiscal year 1927: Amount specified in appropriation acts.....		

*Voucher transactions*

	Reclama- tion fund	Increase of compensa- tion (net)	Total
Disbursements and net transfers.....	\$1, 395, 043. 72	\$25, 279. 34	\$1, 420, 323. 06
Less collections.....	562, 946. 43		562, 946. 43
Net investment June 30, 1926.....	832, 097. 29	25, 279. 34	857, 376. 63

## NORTH DAKOTA, WILLISTON PROJECT—Continued

## Construction account

	Fiscal year 1926	To June 30, 1926
Cost of irrigation works:		
Original construction.....	\$16, 774. 93	\$487, 573. 62
Supplemental construction.....		30, 066. 47
Total construction cost.....	16, 774. 93	517, 630. 09
Operation and maintenance prior to public notice (net).....		165. 00
Operation and maintenance deficits and arrearages to be repaid with construction.....	168, 471. 56	
Less:		
Construction revenues.....	64, 042. 58	74, 787. 41
Nonreimbursable cost.....	442, 677. 68	442, 677. 68
Total to be repaid by water users.....	168, 471. 56	
Contracted repayments: Williston Irrigation district.....	1489, 275. 30	

<sup>1</sup> Contra.

## Operation and maintenance account

	Calendar year 1925	To Dec. 31, 1925	Fiscal year 1926	To June 30, 1926
Operation and maintenance cost.....	\$59, 962. 04	\$901, 201. 72	\$27, 268. 02	\$904, 669. 15
Operation and maintenance returns:				
Contracted.....	29, 200. 87	55, 878. 62	121, 835. 87	34, 042. 75
Penalties.....		1, 918. 76	1, 872. 95	45. 81
Miscellaneous revenues.....	50, 309. 16	489, 711. 15	27, 589. 78	489, 736. 15
Subtotal.....	79, 510. 03	547, 508. 53	3, 890. 96	523, 824. 71
Other credits:				
Operation and maintenance deficits and arrearages to be repaid with construction.....		168, 471. 56	168, 471. 56	
Operation and maintenance uncollectible.....		178, 667. 20		380, 844. 44
Total.....	79, 510. 03	894, 647. 29	37, 586. 64	904, 669. 15
Results:				
Excess.....	19, 547. 99		10, 318. 62	
Deficit.....		6, 554. 43		

<sup>1</sup> Contra.

## Status of current accounts receivable as of June 30, 1926

	Due		Collected				Uncol- lected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits		
			Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	
Construction:							
Charges paid in advance.....			\$8,250.63				
Refunds.....			70.50	\$70.50			
Operation and maintenance:							
Irrigation district (6,587.4 acres).....	\$21,835.87	\$34,042.75	\$4,170.57	\$4,042.75			
Penalties and interest.....	1,872.95	45.81	1,872.95	45.81			
Miscellaneous:							
Rentals of irrigation water.....		2,117.28		2,117.28			
Rentals of power and light.....	27,363.90	483,920.68	30,829.10	483,920.58			
Rentals, grazing, and farm- ing lands.....		249.98		249.98			
Construction forfeitures.....	8,180.13	8,835.45	8,180.13	8,835.45			
Operation and mainte- nance interest and pen- alties.....	7,409.51	7,409.51	7,409.51	7,409.51			
Other.....			13,355.47	26,254.57			
Grand total collections.....			45,550.56	562,946.43			

<sup>1</sup> Contra.

# APPENDIX

## CONSOLIDATED FINANCIAL DATA

TABLE 1.—Consolidated financial statement, June 30, 1926

DEBIT SIDE		
Construction account:		
Primary projects—		
Cost of irrigation works—		
Original construction.....	\$156,912.188.90	
Supplemental construction.....	7,724,923.02	
Value of works taken over.....	1,889,839.11	
Total construction cost.....		\$166,526,901.03
Operation and maintenance prior to public notice (net).....	2,413,468.16	
Operation and maintenance deficits and arrearages to be paid with construction.....	1,601,784.62	
Penalties on water-right charges to be paid with construction.....	5,661.23	
		4,020,914.11
		170,547,815.14
Less—		
Abandoned works and nonreimbursable cost.....	2,796,947.11	
Construction revenues.....	4,884,704.60	
Contributed funds.....	1,024,073.13	
		8,706,724.84
Total to be repaid by water users.....		\$161,839,090.30
Yuma auxiliary project—		
Cost of irrigation works.....	866,813.00	
Less: Construction revenues.....	116.87	
		866,696.13
Operation and maintenance results (Table 9).....		989,532.75
Secondary projects and general investigations:		
Cost of investigations.....	2,690,654.16	
Less: Contributed funds.....	560,762.07	
		2,129,892.09
Plant and equipment		
Materials and supplies.....		1,423,158.08
Accounts receivable:		515,406.25
Current accounts due (Tables 10, 11, 12, 13, 14, 15).....	11,087,116.80	
Deferred accounts not due.....	101,115,288.27	
		112,202,405.07
Prepaid civil-service retirement fund.....		4,967.14
Unadjusted debits: General office expense undistributed, disbursement vouchers in transit, etc.....		200,918.87
Cash (Table 2):		
Balance on hand—		
Reclamation fund.....	8,244,818.70	
Yuma auxiliary fund.....	68,061.20	
General investigations fund.....	8,764.84	
Wind River, Indian fund.....	303.61	
		8,321,988.35
Cash in special deposit account and in transit.....		74,605.71
		8,396,594.06
Total debits.....		288,518,610.74
CREDIT SIDE		
Security for repayment of cost of irrigation works:		
Contracted construction repayments (Table 5).....	131,718,861.77	
Yuma auxiliary contracted repayments.....	843,807.28	
		132,562,669.05
Accounts payable:		
Contractors' earnings.....	388,888.70	
Labor.....	164,012.72	
Purchases.....	96,042.04	
Transportation.....	209,309.68	
Purchases of real property.....	279,475.91	
Miscellaneous.....	299,098.46	
		1,436,827.51



TABLE 1.—*Consolidated financial statement, June 30, 1926—Continued*

## CREDIT SIDE—Continued

Unadjusted credits: Collection vouchers in transit.....		\$37. 65
Unapplied credits: Forfeitures, penalties, hospital results, rentals of withdrawn lands, etc.....		2, 171, 965. 53
Government aid for reclamation of arid lands:		
Reclamation fund (Table 3).....	\$136, 470, 741. 91	
Special funds—		
Judgments, Court of Claims.....	597, 461. 24	
Rio Grande Dam.....	1, 000, 000. 00	
General investigations, 1923-Dec. 31, 1924.....	275, 000. 00	
Increase of compensation.....	2, 797, 980. 33	
Wind River, Indian (Riverton).....	350, 479. 65	
Drainage and cut-over lands.....	90, 815. 06	
Advances to reclamation fund (bond loan).....	\$20, 000, 000. 00	
Less: Amount repaid.....	6, 000, 000. 00	
	14, 000, 000. 00	
Total.....	155, 600, 458. 21	
Less: Nonreimbursable appropriation, Rio Grande Dam (Table 4).....	1, 000, 000. 00	
	154, 600, 458. 21	
Less: Impairment of funds—		
Abandoned construction works (Table 4).....	1, 370, 478. 90	
Nonreimbursable construction cost (Table 4).....	429, 468. 12	
Operation and maintenance cost uncollectible (Table 9).....	453, 298. 10	
	2, 253, 245. 21	
	152, 347, 213. 00	
Total credits.....	286, 518, 610. 74	

TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1926*

	Funds					
	Reclamation	Yuma auxiliary	General investigations	Wind River, Indian (Riverton)	Judgments, Court of Claims	Increase of compensation
Balance on hand July 1, 1925.....	\$6, 575, 104. 23	\$41, 843. 92	\$8, 802. 61	\$303. 61		
Receipts:						
Proceeds from sale of public lands.....	509, 624. 61					
Proceeds from sale of town lots.....	967. 88					
Proceeds from oil leasing act:						
Past production.....	371. 29					
Current production.....	4, 448, 002. 13					
Proceeds from potassium royalties.....	5, 791. 94					
Proceeds from Federal power licenses.....	7, 700. 07					
From sale of lands and water rights.....		11, 619. 41				
From project collections.....	6, 600, 690. 29	37, 958. 55				
From General Treasury.....					\$2, 525. 04	\$0. 66
Total.....	18, 148, 261. 44	68, 183. 06	8, 802. 61	303. 61	2, 525. 04	. 66
Expenditures:						
Repayment bond loan.....	1, 000, 000. 00					
Disbursements.....	8, 903, 442. 74	131. 86	37. 77		2, 525. 04	. 66
Total.....	9, 903, 442. 74	131. 86	37. 77		2, 525. 04	. 66
Balance on hand, June 30, 1926..	8, 244, 818. 70	68, 051. 20	8, 764. 84	303. 61		

<sup>1</sup> Contra.

TABLE 3.—Accretions to reclamation fund, by States

States	Sales of public lands		Sales of reclamation town sites		Proceeds from oil leasing act		Potassium royalties and rentals	Total to June 30, 1926
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926		
Alabama					\$483.00	\$45,832.50		\$45,832.50
Arizona	\$87,436.49	\$2,218,970.34						2,218,970.34
California	68,504.05	7,526,805.99			612,026.89	5,360,648.61	\$30,080.01	12,927,524.51
Colorado	19,943.68	9,968,853.58			44,162.83	112,847.13		9,981,200.71
Idaho	27,978.72	6,770,992.30		\$177,428.18	518.50	714.61		6,949,134.99
Kansas	1,393.16	1,033,000.76						1,033,000.76
Louisiana					490.09	2,568.85		2,568.85
Montana	44,154.98	14,859,943.40	\$2,356.02	127,409.60	137,876.17	683,884.18		15,023,557.18
Nebraska	4,891.98	2,067,064.31						2,067,064.31
Nevada	10,626.65	5,945,065.23			786.00	1,164.00		2,045,230.33
New Mexico	50,320.41	12,204,145.88			9,154.60	15,997.70		5,912,158.44
North Dakota	1,588.08	5,923,205.76			4,885.21	17,958.01		12,228,102.89
Oklahoma	20,587.25	17,603,033.61						5,923,205.76
South Dakota	4,969.62	7,693,177.87		74,875.82	132.11	264.59		11,603,033.61
Utah	92,531.32	3,798,317.58			17,284.70	98,885.21		7,770,338.08
Washington	26,824.67	7,316,808.49			10,892.02	10,113.59		8,870,102.79
Wyoming	69,364.54	7,940,942.89	\$1,368.14	207,884.34	3,619,768.55	21,868,867.01		28,913,068.74
Total	509,694.61	107,674,913.75	967.88	587,568.04	4,448,373.42	28,168,793.99	30,080.01	136,452,285.79
Proceeds, Federal water-power licenses								18,456.15
Grand total								136,470,741.91

: Proceeds for fiscal year 1926, \$7,700.07.

: Contra.

: Proceeds for fiscal year 1926, \$8,791.94.

TABLE 4.—Consolidated statement, by projects, of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance arrears		Construction revenues and contributed funds (contra)		Abandoned works and nonreimbursable cost <sup>1</sup>	Total to be repaid by water users	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926		Fiscal year 1926	To June 30, 1926
Arizona: Salt River		\$12,744,222.59		\$115,993.50				\$2,312,966.81	\$382,067.31		\$10,166,021.97
Arizona-California:											
Yuma	\$321,787.07	9,175,546.24	\$422.91	371,194.58		\$2,921.96	\$2,719.10	161,298.09	\$319,621.31	9,398,264.69	
California: Orland	79,519.99	1,221,384.38	\$148.50	\$12,026.99			1,035.06	16,610.38	78,335.83	1,192,747.01	
Colorado:											
Grand Valley	89,914.31	4,723,070.55	\$102.15	\$113,403.08			305.06	60,008.76	89,447.10	4,776,404.87	
Uncampagne	264.00	6,438,176.91	\$1,391.22	300,321.93			\$6,307.19	23,338.05	5,176.97	6,667,768.96	
Idaho:											
American Falls	2,375,626.79	6,153,088.81		422,192.62			137,139.49	\$54,174.54			
Boise	316,793.28	14,232,328.86				9,698.31	8,084.32	215,390.12		2,238,487.30	6,207,263.35
King Hill		1,904,898.80					2,159.20	28,187.27		308,708.96	14,448,829.67
Minidoka		6,020,745.09	\$625.96	154,421.34		20,630.12	55,787.63	1,487,075.80	\$2,159.20	1,876,711.83	
Kansas: Garden City	13,279.70	342,963.68		52,868.10				61,356.82	\$43,133.83	5,398,720.35	
Montana:											
Humtley	\$268.00	1,498,498.72	\$190.75	\$1,000.05		10,980.00	539.44	17,747.54	\$988.19	1,490,731.43	
Milk River	62,112.05	6,742,873.04	43,356.80	467,037.48			2,871.28	65,092.16	102,597.66	7,143,818.36	
Sun River	18,846.18	4,407,615.96	9,071.77	140,385.33		16,373.99	1,380.83	40,740.45	26,527.12	4,528,694.83	
Montana-North Dakota: Lower Yellowstone			\$682.02	\$1,536.20		522,500.05	903.97	46,776.22			
Nebraska: Wyoming:											
North Platte	1,076,987.25	17,461,335.43	\$3,758.49	577,530.28		150,483.08	126,545.52	276,612.29	946,685.24	17,912,736.50	
Nevada: Newlands	27,667.86	7,635,319.37	\$538.37	\$2,078.48		12,287.02	10,249.68	185,756.48	29,166.83	7,963,929.79	
New Mexico:											
Carlsbad	20,330.85	1,458,995.57	\$1,547.69	\$15,172.10		1,624.00	1,005.91	25,035.28	17,777.25	1,420,722.19	
Hondo		339,491.68		32,952.01				541.03			
New Mexico-Texas:											
Rio Grande	299,457.82	14,071,708.04	\$12,740.08	\$287,676.86			2,047.92	39,393.52	254,699.82	12,744,635.66	
North Dakota:											
Buford-Trenton		223,423.06		\$31.75				1,907.62	221,423.69		
Williston	16,774.93	517,630.09		\$165.00			64,042.58	74,787.41	442,077.08		
Oregon:											
Baker	2,504.23	63,860.68						5,000.00		2,504.23	68,360.68
Umatilla	717,485.13	4,994,819.31						29,886.65	715,203.58	5,155,560.61	
Vale	16,546.88	16,546.88				190,627.95	2,281.55		16,546.88		16,546.88



TABLE 5.—Consolidated statement of contracted construction repayments

State and project	Value of contracts	
	Fiscal year 1926	To June 30, 1926
Arizona: Salt River.....		\$10,166,021.97
Arizona-California: Yuma.....	\$394,078.30	6,395,702.22
California: Orland.....		1,119,215.25
Colorado:		
Grand Valley.....		1,000,000.00
Uncompahgre.....		6,713,584.50
Idaho:		
American Falls.....	<sup>1</sup> 157,307.50	3,190,330.50
Boise.....	<sup>1</sup> 598,999.05	13,893,390.85
King Hill.....		2,000,000.00
Minidoka.....	4,329.22	6,041,280.62
Montana:		
Huntley.....	5,748.75	1,346,195.46
Sun River.....	<sup>1</sup> 5,458.80	416,964.33
Montana-North Dakota: Lower Yellowstone.....	<sup>1</sup> 125.80	3,614,166.31
Nebraska-Wyoming: North Platte.....	11,550.00	15,336,536.16
Nevada: Newlands.....	<sup>1</sup> 133,553.67	2,406,779.57
New Mexico: Carlsbad.....	870.00	1,425,182.75
New Mexico-Texas: Rio Grande.....		13,500,000.00
North Dakota: Williston.....	<sup>1</sup> 469,275.30	
Oregon: Umatilla.....		4,423,823.97
Oregon-California: Klamath.....	5,135.50	3,960,852.10
South Dakota: Belle Fourche.....		4,345,277.42
Utah: Strawberry Valley.....	10,920.00	3,114,336.96
Washington:		
Okanogan.....	15,447.58	1,513,287.57
Yakima.....	1,708,061.06	11,620,364.66
Yakima-Kittitas.....	9,000,000.00	9,000,000.00
Wyoming: Shoshone.....	<sup>1</sup> 604,241.41	5,161,608.30
<b>Total.....</b>	<b>9,162,167.18</b>	<b>131,718,961.77</b>

<sup>1</sup> Contra.

TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results, calendar year 1935

State and project	Cost	Operation and maintenance returns				Other credits (amounts to be repaid with construction)	Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues		
Arizona: Yuma auxiliary	\$65,037.13	\$40,946.08	\$11,074.09	\$7,767.01	\$627.05		—\$4,034.00
Arizona-California: Yuma	267,548.43	314,887.20	135.57	108.87	14,524.67	\$976.28	+66,066.78
California: Orland	27,943.04	34,329.22	5,264.09	2,869.77	660.26		+7,072.14
Colorado: Uncompahgre	131,955.39	132,827.44			2,790.83		+6,027.19
Idaho:							
Boise	205,688.49	203,856.13	16,786.27	1,330.79	12,891.82	9,098.31	+26,223.26
Boise (drainage)	123,213.05	138,626.79	13,067.68	1,266.37			+27,115.15
King Hill	41,086.74	33,552.75			342.89	7,141.10	—7,141.10
Minidoka	115,612.81	117,799.29	841.37	2,107.56	260.00	8,316.26	+9,436.56
Montana:							
Huntley	35,113.51	35,347.41	1,656.37	1,080.45	1,127.40		+1,937.23
Sun River	12,013.58	11,403.14	2,311.11	207.90	314.15		+1,905.92
Montana-North Dakota: Lower Yellowstone	66,566.58	65,783.56			783.02		
Nebraska-Wyoming: North Platte	365,143.55	351,411.95	194.83	1,371.13	1,528.80		—13,379.10
Nevada: Newlands	94,612.47	51,608.29	8,698.24	2,616.74	5,248.83	12,287.08	—19,316.83
New Mexico: Carlsbad	46,177.90	37,991.88	1,436.13	1,234.61	1,640.08		—6,344.51
New Mexico-Texas: Rio Grande	328,863.38	312,808.14			16,055.24		
North Dakota: Williston	59,992.04	29,200.87			50,309.16		+19,547.93
Oregon: Umatilla	35,275.58	28,940.88		11.54	980.00		+10,366.04
Oregon-California: Klamath	77,624.51	63,774.05	341.76	63.82	1,735.91		—11,736.63
South Dakota: Belle Fourche	72,978.89	75,000.00			2,211.74		+4,224.85
Utah: Strawberry Valley	21,447.26	16,788.87	1,265.01	1,181.90	2,417.20	2,276.75	+117.67
Washington:							
Okanogan	71,068.62	55,450.92	3,842.57	5.70	2,040.12	15,447.88	+5,715.87
Yakima	258,294.57	247,700.37	12,222.58	3,697.41	6,879.95	125.54	+3,026.76
Wyoming: Shoshone	61,881.07	27,086.31	16,785.97	967.37	8,937.14	1,747.99	—10,988.01
Total	2,573,066.46	2,430,039.54	95,893.93	27,529.83	134,298.25	47,378.72	+107,012.15

1 Contra.

TABLE 7.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results to December 31, 1926

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction	
Arizona: Yuma auxiliary	\$161,771.31	\$174,845.04	\$337.74	\$1,106.79	\$777.05			+\$13,261.73
Arizona-California: Yuma	2,652,660.92	2,100,557.68	59,806.62	27,826.86	117,534.05		\$2,921.96	—399,066.96
California: Orland	290,867.24	313,311.41	210.01	13,092.62	2,211.70			+11,773.26
Colorado: Uncompahgre	413,801.13	428,213.79	5,768.64	8,883.16	6,840.28			+18,128.32
Idaho:								
Boise	2,108,804.43	2,117,471.39	60,784.78	45,207.13	135,318.49		9,098.31	+168,261.41
Boise (drainage)	2,455,535.13	688,118.27	38,407.48	6,119.71				+264,870.91
King Hill	156,048.79	157,294.95		1,519.05	342.89			
Minidoka	1,779,181.91	1,737,215.59	28,196.04	22,287.04	98,897.31		20,630.12	+83,470.11
Montana:								
Huntley	946,615.59	526,376.98	12,574.22	9,788.32	10,055.98		10,980.99	—398,414.83
Sun River	230,134.25	181,822.00	5,780.39	3,400.14	2,793.49		16,873.69	—26,764.52
Montana-North Dakota: Lower Yellowstone	1,087,401.59	399,123.98	2.59	4.63	125,779.72		522,501.05	
Nebraska: North Platte	2,485,518.04	2,437,389.77	27,036.74	35,410.41	23,232.44		150,455.08	+119,208.78
Nebraska: Newlands	1,379,737.80	25,280.24	22,886.22	22,886.22	24,697.70		16,444.38	—90,018.53
New Mexico: Carlsbad	1,602,723.62	1,346,314.37	24,873.03	10,421.91	16,978.11		1,934.00	+22,261.95
New Mexico-Texas: Rio Grande	1,282,873.76	1,212,500.86	1,432.46	4,466.44	28,423.86			
North Dakota:								
Bufford-Trenton	74,781.07	2,317.41			10.00	\$72,453.66		
Williston	901,201.72	85,878.62	1,918.76		489,711.15	178,667.20	168,471.56	—6,554.43
Oregon: Umatilla	657,754.05	424,831.37	6,375.70	3,365.71	39,224.74		190,637.95	—3,556.48
Oregon-California: Klamath	764,210.87	738,574.70	3,169.63	4,709.78	14,617.81		3,712.03	+93,301.57
South Dakota: Belle Fourche	1,161,260.26	713,721.99	31,955.32	9,241.55	14,689.18		506,436.99	+2,782.27
Utah: Strawberry Valley	418,419.22	402,020.16	7,590.68	11,462.06	19,600.63		3,622.08	
Washington:								
Okanogan	522,746.21	414,430.28	13,299.81	370.73	70,160.95		26,194.37	—1,051.63
Yakima	3,052,041.57	2,904,365.56	51,993.23	36,636.61	100,945.95		77,238.54	+65,875.09
Wyoming: Shoshone	776,889.00	698,554.18	27,370.35	11,212.07	32,067.36		43,159.04	+13,069.86
Total	24,244,008.89	20,656,942.33	424,301.25	280,350.94	1,371,731.65	281,120.86	1,770,429.35	—49,834.29

TABLE 8.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results, fiscal year 1936

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction	
Arizona: Yuma auxiliary.....	\$43,353.77	\$44,256.18			\$326.05			+51,728.46
California: Yuma.....	326,422.91	306,419.27	\$13,022.78	\$6,302.14	26,041.33		\$976.25	+12,664.56
California: Orland.....	26,167.02	34,327.95	802.17	1,371.72	553.78			+7,645.14
Colorado: Uncompahgre.....	137,453.93	132,677.08	6,668.07	2,870.83	2,960.67			+2,291.06
Idaho:								
Boise.....	165,015.74	200,412.49	2,702.13	1,210.44	11,696.29			+57,567.73
Boise (drainage).....	116,733.04	68,906.56	6,720.32	730.64				-41,837.80
King Hill.....	22,008.35	32,846.92			342.89			+10,491.46
Minidoka.....	102,066.96	126,941.80	1,409.83	1,776.25	464.36			+23,343.77
Montana:								
Humtley.....	38,306.57	36,051.82	2,204.98	1,070.70	998.90			-30.57
Sun River.....	11,676.49	11,028.00	1,080.90	214.62	304.29			+472.08
Montana-North Dakota: Lower Yellowstone.....	56,183.26	66,783.56			950.68			+10,550.98
Nebraska-Wyoming: North Platte.....	254,578.27	254,680.52	83,378.77	1,301.51	1,176.50			+83,290.01
Nevada: Newlands.....	99,554.50	74,245.25	6,964.50	2,757.17	1,403.00		12,287.02	-7,361.90
New Mexico: Carlisbad.....	48,364.17	38,021.88	606.85	1,309.30	1,764.07			-9,248.67
New Mexico-Texas: Rio Grande.....	235,913.10	306,014.02	1,491.51		21,919.93			-7,487.64
North Dakota: Williston.....	27,268.02	21,835.87	11,872.96		27,580.78	\$202,177.24	1,168,471.56	+10,318.02
Oregon: Umatilla.....	35,895.73	23,940.88	1,375.44	5.06	908.58			-9,676.91
Oregon-California: Klamath.....	70,843.22	63,805.18	1,151.67	114.22	1,863.17			-5,337.42
South Dakota: Belle Fourche.....	72,870.57	75,000.00			2,073.24			+4,702.67
Utah: Strawberry Valley.....	21,599.14	17,153.87	1,428.33	1,212.90	2,361.16		2,276.75	+430.18
Washington:								
Okanogan.....	74,453.58	58,969.92	5,774.94	11.70	868.27		15,447.58	+6,555.43
Yakima.....	254,604.31	248,340.51	12,505.63	3,653.02	7,612.61			+8,110.42
Wyoming: Shoshone.....	57,068.26	22,268.56	16,668.79	3,388.24	9,041.82		1,921.16	-11,418.40
<b>Total.....</b>	<b>2,402,316.91</b>	<b>2,227,036.35</b>	<b>162,862.85</b>	<b>26,439.57</b>	<b>123,838.35</b>	<b>202,177.24</b>	<b>1,189,406.12</b>	<b>+147,762.19</b>

† Contra.



TABLE 9.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results, to June 30, 1936

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amount to be repaid with construction	
Arizona: Yuma auxiliary.	\$183,332.81	\$215,808.14	\$337.74	\$1,104.79	\$1,483.05			+ \$33,380.33
Arizona-California: Yuma.	2,855,178.84	2,090,680.22	68,510.86	34,211.87	137,013.95		\$2,921.96	- 580,683.72
California: Orland.	300,023.91	313,310.12	427.51	14,397.66	2,284.45			- 4,390.49
Colorado: Uncompahgre.	405,276.53	427,723.44	9,234.26	8,928.48	9,741.90			- 57,505.41
Idaho:								
Boise.	2,178,473.13	2,130,631.02	62,189.46	46,526.20	135,167.59		9,698.31	+ 112,693.06
Boise (drainage).	508,955.24	687,723.77	38,610.09	6,123.43				+ 211,264.19
King Hill.	156,621.99	157,798.15		1,519.05	342.89			
Minidoka.	1,824,165.34	1,765,015.25	29,169.11	22,341.74	99,161.87		20,630.12	+ 67,460.07
Montana:								
Huntley.	945,624.75	526,376.86	14,289.24	9,808.64	10,449.17		10,980.90	- 413,337.22
Sun River.	227,289.15	181,423.46	6,464.01	3,432.32	2,898.01		18,378.99	- 32,652.10
Moussie-North Dakota: Lower Yellowstone.	1,069,745.08	389,123.89	2.89	4.63	126,044.88		522,500.05	- 39,078.51
Nebraska-Wyoming: North Platte.	2,576,774.78	2,436,886.67	110,286.14	35,716.07	26,071.14		184,863.08	+ 123,234.18
Nevada: Newlands.	1,451,471.83	1,242,606.46	28,178.23	23,017.23	23,539.87		16,444.88	- 141,517.13
New Mexico: Carlisbad.	1,628,084.30	591,460.32	25,419.02	10,928.68	18,404.16		1,934.00	- 1,765.48
New Mexico-Texas: Rio Grande.	1,412,563.54	1,205,716.74	2,917.97	4,496.44	29,479.07			- 178,927.20
North Dakota:								
Buford-Trenton.	74,781.07	2,317.41			10.00	\$72,453.06		
Williston.	904,660.15	34,042.75	45.81		489,738.15	380,844.44		
Oregon: Umatilla.	676,961.29	424,831.37	7,751.14	3,310.79	39,683.32		190,627.95	- 17,378.30
Oregon-California: Klamath.	802,508.12	738,660.83	3,255.83	4,700.18	14,807.01		2,712.03	- 48,701.05
South Dakota: Belle Fourche.	1,195,822.73	713,731.89	31,955.32	9,241.55	15,900.13		606,536.99	+ 62,950.95
Utah: Strawberry Valley.	428,240.13	402,020.16	7,861.79	11,783.40	19,719.42		3,622.06	- 6,800.08
Washington:								
Okanogan.	552,246.27	417,930.28	17,422.26	376.73	69,358.10		25,194.37	- 22,717.99
Yakima.	3,165,507.56	2,971,927.13	57,332.66	39,024.46	100,215.78		77,288.54	+ 8,179.99
Wyoming: Shoshone.	811,548.84	691,188.73	28,036.72	11,065.98	37,428.46		42,965.87	- 22,975.04
Total.	25,441,864.36	20,782,015.03	549,897.20	302,114.41	1,417,451.07	453,286.10	1,601,784.62	- 939,532.75

TABLE 10.—Accounts receivable, construction water-right charges (including Warren Act contract charges and contributed funds)

State and project	Due		Collected			Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits to June 30, 1926	
			Fiscal year 1926	To June 30, 1926		
Arizona:						
Salt River.....	\$643,862.05	\$2,950,746.01	\$643,862.05	\$2,950,746.01	-----	-----
Yuma.....	1,108,379.05	843,517.28	1,111,737.21	674,252.24	-----	\$169,265.04
Arizona-California: Yuma..	351,962.48	2,237,423.75	345,785.33	2,097,599.43	\$4,024.28	135,800.04
California: Orland.....	66,552.92	437,838.50	82,798.60	423,057.18	-----	14,781.82
Colorado: Uncompahgre....	106,701.08	477,324.04	118,059.28	196,892.97	51,117.51	230,313.56
Idaho:						
American Falls.....	920,672.73	2,959,963.98	1,360,055.48	2,980,283.39	-----	29,680.59
Boise.....	698,272.29	3,781,096.93	120,621.95	1,955,365.95	25,092.00	1,800,638.98
King Hill.....	40,000.00	88,025.66	-----	8,025.66	-----	80,000.00
Minidoka.....	337,426.76	3,849,396.48	265,212.80	3,036,191.07	154,436.61	688,767.80
Montana:						
Huntley.....	33,333.67	482,359.21	28,446.55	424,411.73	502.21	57,445.87
Sun River.....	15,040.80	195,645.83	9,510.90	165,765.21	479.30	29,401.32
Montana-North Dakota:						
Lower Yellowstone.....	32,648.96	134,706.92	19,286.13	70,149.45	-----	64,557.47
Nebraska-Wyoming: North Platte.....	415,076.43	3,576,355.36	71,176.44	1,893,644.20	36,527.78	1,646,183.38
Nevada: Newlands.....	75,910.14	716,005.42	48,602.10	625,676.80	9,005.29	81,323.33
New Mexico: Carlsbad.....	60,783.87	602,298.49	48,191.64	575,699.45	81.25	26,517.79
New Mexico-Texas: Rio Grande.....	232,965.70	705,330.90	232,926.14	705,271.34	-----	59.56
Oregon: Umatilla.....	94,411.22	660,635.02	2,807.38	391,485.03	-----	269,149.99
Oregon-California: Klamath.....	65,172.06	757,864.57	52,461.74	713,806.69	-----	44,057.88
South Dakota: Belle Fourche.....	137,078.24	796,373.20	17,108.57	478,866.62	266.57	317,240.01
Utah: Strawberry Valley.....	167,825.17	933,144.44	105,850.46	662,488.64	-----	270,655.80
Washington:						
Okanogan.....	24,008.56	105,665.01	8,738.82	73,553.22	-----	32,111.79
Yakima.....	368,757.73	4,505,467.40	438,664.86	4,203,755.80	36,047.07	265,664.53
Yakima-Kittitas.....	1,000.00	1,000.00	1,000.00	1,000.00	-----	-----
Wyoming: Shoshone.....	78,698.69	1,047,610.14	10,306.19	641,163.11	2,528.58	403,918.45
Total.....	4,862,900.50	32,845,793.54	4,009,731.19	25,898,151.19	\$320,108.45	6,627,533.90
Paid in advance of due dates.....	-----	-----	1,604,746.49	1,398,834.45	\$29,561.82	-----
Refunds.....	-----	-----	\$21,660.67	\$46,180.30	-----	-----
Total collections.....	-----	-----	3,426,645.37	26,343,165.94	349,670.27	-----

1 Contra.

2 Transferred from advance payments. No collections during year.

3 Other credits for fiscal year, \$10,123.29. For details see project statements.

4 Decrease for year, \$4,826.11. For details see project statements.

5 For details see project statements.

NOTE.—This table does not include adjustments of the accounts under contracts entered into prior to the end of the fiscal year with irrigation districts under the acts of Dec. 5, 1924, and May 25, 1926

TABLE 11.—Accounts receivable, operation and maintenance charges (after public notice)

State and project	Due		Collected			Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits to June 30, 1926	
			Fiscal year 1926	To June 30, 1926		
Arizona: Yuma auxiliary...	\$44,256.18	\$215,808.14	\$36,948.46	\$131,604.02	\$1,106.79	\$83,067.33
Arizona-California: Yuma...	306,419.27	2,099,680.22	226,789.87	1,817,310.81	39,336.28	243,083.13
California: Orland...	34,327.95	313,310.12	34,230.13	263,419.52	14,397.66	5,492.94
Colorado: Uncompahgre...	132,677.08	427,723.44	129,468.57	281,588.04	20,373.93	125,761.47
Idaho:						
Boise	209,413.49	2,130,631.02	46,693.61	1,460,179.39	46,526.29	623,925.34
Boise (drainage)	68,905.56	687,732.77	85,816.11	467,395.07	6,123.43	214,214.27
King Hill	32,846.92	157,798.15	160.15	59,192.22	1,519.06	97,696.88
Minidoka	135,819.61	1,755,137.46	95,951.93	1,397,357.98	75,666.36	282,113.12
Montana:						
Huntley	36,051.82	526,376.86	35,693.54	418,077.72	10,551.83	97,747.31
Sun River	11,028.00	181,442.46	8,739.87	148,526.47	3,834.10	29,081.89
Montana-North Dakota:						
Lower Yellowstone	52,427.20	343,693.79	42,673.45	95,407.17	4.63	248,261.99
Nebraska-Wyoming: North Platte	254,680.52	2,450,886.67	77,187.03	1,600,128.56	46,567.46	894,190.65
Nevada: Newlands	87,136.19	1,110,431.26	117,586.70	992,378.12	36,471.68	81,581.46
New Mexico: Carlsbad	38,021.88	591,490.32	36,255.86	569,000.76	10,928.68	11,500.88
New Mexico-Texas: Rio Grande	282,114.40	1,091,260.20	246,790.25	1,044,361.75	4,486.44	42,412.01
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston	21,835.87	34,042.75	4,170.57	34,042.75		
Oregon: Umatilla	39,760.66	402,964.60	7,997.60	319,312.75	3,310.79	80,341.06
Oregon-California: Klamath	71,344.95	684,709.83	62,390.24	610,234.28	30,354.13	44,121.42
South Dakota: Belle Fourche	78,068.96	679,927.27	57,425.90	540,768.22	9,376.82	129,782.23
Utah: Strawberry Valley	41,764.70	402,020.16	33,402.70	330,242.19	11,783.40	59,994.57
Washington:						
Okanogan	66,123.50	385,630.26	41,168.21	309,569.30	2,632.31	73,428.67
Yakima	248,340.51	2,971,927.13	270,928.12	2,764,742.47	40,071.80	167,112.86
Wyoming: Shoshone	22,258.56	691,188.73	32,717.42	471,810.67	20,261.26	199,116.60
Total	2,270,952.04	20,338,131.04	1,722,843.05	16,159,067.64	435,685.12	3,743,388.28
Paid in advance of due dates			10,315.76	26,113.99	1,014.44	
Penalties and interest	161,487.41	548,521.76	57,577.62	390,865.64	17,652.13	140,003.99
Refunds			1,132.32	14,569.77		
Total collections			1,771,237.23	16,590,607.04	454,351.69	

<sup>1</sup> Contra.<sup>2</sup> \$13,709.31 transferred from advance payments. Actual collections for year, \$43,716.59.<sup>3</sup> Other credits for fiscal year \$38,588.64. For details see project statements.<sup>4</sup> For details see project statement.<sup>5</sup> Increase for year \$226.63. For details see project statements.<sup>6</sup> Decrease for year \$511.59. For details see project statements.

NOTE.—This table does not include any adjustment of the accounts under contracts entered into prior to the end of the fiscal year with irrigation districts under the acts of Dec. 5, 1924, and May 25, 1926.

TABLE 12.—Accounts receivable, rentals of irrigation water

State and project	Due		Collected			Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits to June 30, 1926	
			Fiscal year 1926	To June 30, 1926		
Arizona:						
Salt River.....		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary.....	\$886. 05	1, 583. 05	\$837. 05	1, 102. 05		\$481. 00
Arizona-California: Yuma.....	22, 944. 51	469, 271. 95	21, 563. 51	463, 427. 38	\$4, 574. 15	1, 270. 42
California: Orland.....	220. 50	120, 825. 00	220. 50	120, 825. 00		
Colorado:						
Grand Valley.....	47, 996. 85	375, 720. 17	60, 722. 52	355, 907. 08	6, 234. 13	13, 578. 96
Uncompahgre.....	4, 371. 89	1, 200, 004. 03	9, 705. 04	1, 173, 986. 67	13, 047. 90	12, 969. 46
Idaho:						
Boise.....	11, 698. 29	773, 902. 06	6, 699. 02	744, 968. 07	4, 720. 50	24, 213. 49
Minidoka.....	1, 090. 32	273, 698. 30	1, 090. 32	270, 464. 07	3, 234. 23	
Montana:						
Huntley.....	842. 09	8, 619. 54	1, 206. 29	8, 583. 88		35. 66
Milk River.....	19, 109. 32	229, 195. 21	20, 011. 54	211, 385. 89	1, 194. 40	16, 614. 92
Sun River.....	16, 862. 38	88, 701. 12	20, 533. 90	63, 292. 54	1, 069. 54	24, 339. 04
Montana-North Dakota:						
Lower Yellowstone.....	151. 70	124, 002. 19	1, 540. 53	123, 986. 26		15. 93
Nebraska-Wyoming: North Platte.....	103, 385. 19	391, 328. 44	39, 259. 14	319, 186. 54	10. 00	72, 181. 90
Nevada: Newlands.....	2, 001. 37	26, 399. 14	1, 980. 37	20, 198. 29	6, 176. 85	24. 00
New Mexico:						
Carlsbad.....	2, 980. 37	29, 077. 42	2, 980. 37	29, 077. 42		
Hondo.....		9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande.....	34, 809. 01	1, 179, 727. 69	48, 407. 33	1, 166, 622. 84		13, 104. 85
North Dakota:						
Buford-Tranton.....		31. 75		31. 75		
Williston.....		2, 117. 28		2, 117. 28		
Oregon: Umatilla.....	718. 98	34, 864. 52	718. 98	34, 864. 52		
Oregon-California: Klamath.....	1, 888. 17	54, 593. 56	1, 916. 83	54, 497. 72		95. 84
South Dakota: Belle Fourche.....	464. 45	6, 465. 34	464. 45	6, 297. 54	17. 80	150. 00
Utah: Strawberry Valley.....	2, 702. 00	17, 000. 54	2, 702. 00	17, 000. 54		
Washington:						
Okanogan.....	356. 40	199, 970. 88	726. 40	197, 386. 69	2, 584. 19	
Yakima.....	4, 100. 34	151, 467. 50	4, 683. 74	150, 624. 44		843. 06
Wyoming:						
Riverton.....	413. 00	674. 75	413. 00	674. 75		
Shoshone.....	8, 539. 98	33, 967. 67	8, 088. 92	33, 247. 92	55. 92	663. 83
Total.....	288, 533. 16	7, 959, 064. 81	256, 461. 84	7, 735, 612. 84	42, 919. 61	180, 532. 36

<sup>1</sup> Other credits for year, \$5,298.31. For details see project statements.

TABLE 13.—Accounts receivable, rentals of power and light

State and project	Due		Collected			Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits to June 30, 1926	
			Fiscal year 1926	To June 30, 1926		
Arizona: Salt River .....		\$998, 411. 03		\$998, 411. 03		
Idaho:						
Boise .....	\$6, 196. 10	145, 366. 01		96, 424. 61	\$48, 941. 40	
Minidoka .....	93, 441. 45	1, 000, 732. 11	\$104, 467. 56	980, 777. 30	9, 608. 11	\$10, 346. 70
Nebraska-Wyoming: North Platte .....	98, 702. 44	251, 626. 31	70, 351. 65	199, 460. 41	44, 006. 37	8, 159. 53
Nevada: Newlands .....	15, 995. 65	232, 443. 96	15, 843. 53	205, 595. 95	25, 505. 75	1, 342. 26
New Mexico-Texas: Rio Grande .....		2, 243. 33		2, 243. 33		
North Dakota: Williston .....	27, 353. 90	483, 920. 58	30, 829. 10	483, 920. 58		
Oregon-California: Klamath .....	175. 75	7, 872. 93	175. 75	7, 872. 93		
Utah: Strawberry Valley .....	29, 464. 51	206, 797. 61	29, 957. 97	203, 156. 70		3, 640. 91
Washington:						
Okanogan .....		1, 754. 71		1, 754. 71		
Yakima .....		3, 635. 33		3, 635. 33		
Wyoming:						
Riverton .....	10, 861. 87	14, 788. 78	11, 057. 76	14, 058. 55		730. 23
Shoshone .....	11, 690. 63	35, 750. 88	11, 316. 11	34, 645. 38	16. 00	1, 089. 50
Total .....	293, 852. 30	3, 385, 343. 57	273, 999. 43	3, 231, 956. 81	128, 077. 63	25, 309. 13

<sup>1</sup> Other credits for year \$32,634.42. For details see project statements.

TABLE 14.—*Accounts receivable, rentals of grazing and farming lands*

State and project	Due		Collected			Uncollected June 30, 1926
	Fiscal year 1926	To June 30, 1926	Cash		Other credits to June 30, 1926	
			Fiscal year 1926	To June 30, 1926		
Arizona: Salt River		\$19,373.14		\$19,373.14		
Arizona-California: Yuma	\$3,164.03	20,139.65	\$3,274.55	19,977.00		\$162.65
California: Orland	8,171.78	8,251.28	7,571.78	7,651.28		609.00
Colorado:						
Grand Valley	80.00	424.00	80.00	374.00	\$7.50	42.50
Uncompahgre	71.90	314.35	71.90	314.35		
Idaho:						
Boise	\$ 1,893.25	19,657.75	\$ 1,301.70	19,539.30		98.45
Minidoka	401.09	35,539.94	441.11	31,475.10		4,064.84
Montana:						
Huntley	1,142.32	14,770.10	1,174.87	14,330.93		449.17
Milk River	4,352.91	39,081.14	4,387.91	38,662.49	38.88	379.77
Sun River	5,327.01	42,756.11	5,489.28	39,822.96		2,933.15
Montana-North Dakota:						
Lower Yellowstone	290.00	3,567.63	217.70	3,495.33		72.30
Nebraska-Wyoming: North Platte	6,994.90	96,775.60	7,133.80	91,995.63	72.31	4,707.66
Nevada: Newlands	2,295.23	37,746.05	4,663.26	36,917.70		828.35
New Mexico: Carlsbad	674.08	14,316.45	762.03	13,755.45		561.00
New Mexico-Texas: Rio Grande	466.58	2,578.28	515.08	2,578.28		
North Dakota:						
Buford-Trenton		423.93		423.93		
Williston		249.98		249.98		
Oregon: Umatilla	357.15	2,897.90	508.15	2,825.90		72.00
Oregon-California: Klamath	34,968.27	236,717.72	34,134.85	235,800.30	84.00	833.42
South Dakota: Belle Fourche	309.17	1,356.28	329.17	1,214.68		141.60
Utah: Strawberry Valley	20,880.50	187,631.56	20,880.50	187,631.56		
Washington:						
Okanogan	9.00	865.50	9.00	865.50		
Yakima	2,099.55	27,131.24	2,150.75	26,971.24		160.00
Yakima-Kittitas	\$ 7,344.42	7,344.42	\$ 7,344.42	7,344.42		
Wyoming: Shoshone	1,038.80	11,666.91	1,038.80	11,435.91		231.00
Secondary projects	7,855.88	182,778.14	7,832.41	139,836.20	42,497.67	444.27
Total	106,461.27	1,014,355.05	108,679.62	954,872.56	42,700.36	16,782.13

<sup>1</sup> Takes into account rentals of purchased lands not previously reported. Actual business for year: Accruals, \$664.78; collections, \$64.78.

<sup>2</sup> Contra.

<sup>3</sup> Transferred from secondary.

<sup>4</sup> Other credits for year, \$72.31. For details see project statements.

TABLE 15.—*Accounts receivable, miscellaneous and sundry*

State and project	Amount	State and project	Amount
Arizona: Yuma auxiliary	\$23.95	New Mexico: Carlsbad	999.57
Arizona-California: Yuma	3,277.90	New Mexico-Texas: Rio Grande	20,896.25
Colorado:		Oregon: Umatilla	1,247.37
Grand Valley	6,032.17	Oregon-California: Klamath	946.20
Uncompahgre	5,023.24	South Dakota: Belle Fourche	13,965.25
Idaho:		Utah: Strawberry Valley	3,154.47
American Falls	2,781.28	Washington:	
Boise	57,191.33	Okanogan	2,417.69
King Hill	43.49	Yakima	6,728.20
Minidoka	1,803.35	Wyoming:	
Montana:		Riverton	2,039.77
Huntley	20.00	Shoshone	27,749.01
Milk River	470.25	Secondary projects	31,920.54
Sun River	1,401.48	Washington office	1,261.00
Montana-North Dakota: Lower Yellow-		Denver office	17,376.63
stone	17.75	Field legal	5,170.51
Nebraska-Wyoming: North Platte	139,033.42		
Nevada: Newlands	1,476.83	Total	353,567.01

TABLE 16.—Voucher transactions, all funds and net investments, as of June 30, 1926

State and project	Expenditures <sup>1</sup>		Collections <sup>2</sup>		Net investment	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
<b>Arizona:</b>						
Salt River.....		\$14,671,484.24	\$670,842.15	\$7,210,775.38	\$670,842.15	\$7,460,708.86
Yuma auxiliary.....	\$67,278.28	870,253.88	26,384.14	856,657.47	40,804.14	22,596.41
Arizona-California: Yuma	563,179.83	13,540,926.68	641,643.81	5,138,343.01	* 78,463.98	8,411,583.67
California: Orland.....	55,412.30	1,613,269.84	122,188.19	962,173.94	* 66,775.89	721,085.90
<b>Colorado:</b>						
Grand Valley.....	161,597.99	5,350,021.89	76,997.35	520,443.41	84,600.64	4,838,573.48
Uncompahgre.....	125,906.29	8,525,663.77	289,254.16	1,926,289.09	* 163,347.67	6,599,404.72
<b>Idaho:</b>						
American Falls.....	2,418,347.26	6,247,340.04	986,973.42	3,710,630.44	1,431,373.84	2,536,709.60
Boise.....	473,342.88	18,501,347.54	280,413.06	5,525,591.74	192,926.82	12,975,753.80
King Hill.....	23,466.28	2,109,081.50	967.93	126,811.19	22,473.35	1,980,220.31
Minidoka.....	164,506.32	9,151,738.62	513,005.21	6,119,712.40	* 348,498.89	3,082,026.22
Kansas: Garden City.....		390,493.54		58,002.27		332,493.27
<b>Montana:</b>						
Huntley.....	31,229.45	2,514,917.75	72,351.16	952,937.26	* 41,121.71	1,561,980.49
Milk River.....	160,719.70	7,572,031.08	25,818.61	441,010.54	184,901.09	7,131,020.49
Sum River.....	52,046.96	4,960,804.60	80,142.21	559,845.16	1,904.75	4,420,959.45
Montana-North Dakota:						
Lower Yellowstone.....	57,536.68	4,282,997.64	86,261.84	428,736.79	* 28,715.16	3,854,240.85
<b>Nebraska-Wyoming:</b>						
North Platte.....	1,358,779.92	21,393,457.79	341,117.12	4,686,798.65	* 1,017,662.80	16,706,659.14
Nevada: Newlands.....	127,885.33	9,283,939.64	210,305.22	2,140,017.07	* 82,419.89	7,143,922.57
<b>New Mexico:</b>						
Carlsbad.....	75,440.28	2,127,978.52	92,959.75	1,291,445.53	* 17,519.52	836,532.99
Hondo.....		406,744.36		34,841.70		371,902.66
<b>New Mexico-Texas: Rio Grande.....</b>	599,911.38	17,070,459.19	572,359.01	3,634,599.68	27,552.37	13,435,859.51
<b>North Dakota:</b>						
Buford-Trenton.....	* 14.60	311,175.00	165.00	17,873.93	* 179.60	293,301.07
Williston.....	26,459.90	1,420,323.06	45,550.56	562,946.43	* 19,090.66	857,376.63
<b>Oregon:</b>						
Baker.....	350.74	50,551.57		879.29	350.74	58,672.28
Umatilla.....	606,113.61	5,854,644.99	29,787.00	991,899.92	576,326.61	4,862,745.07
Vale.....	17,475.06	17,444.01	.38	.33	17,474.73	17,543.68
<b>Oregon-California: Klamath.....</b>	222,560.58	6,163,509.80	160,461.23	1,723,010.06	62,069.35	4,440,499.72
<b>Oregon-Idaho: Owyhee.....</b>	19,864.31	24,271.41			19,864.31	24,271.41
<b>South Dakota: Belle Fourche.....</b>	60,437.00	4,805,147.22	47,004.64	1,143,294.44	13,432.36	3,661,852.78
<b>Utah:</b>						
Salt Lake Basin.....	26,255.49	35,112.71			26,255.49	35,112.71
Strawberry Valley.....	42,042.08	4,312,850.81	200,552.76	1,652,796.34	* 158,510.68	2,661,054.47
<b>Washington:</b>						
Okanogan.....	76,906.95	2,086,901.55	61,728.82	561,398.92	15,177.13	1,475,502.63
Yakima.....	226,664.23	18,036,499.54	801,089.27	8,063,976.56	* 574,426.04	9,952,622.98
Yakima-Kittitas.....	181,884.48	181,884.48	31,002.84	31,002.84	150,881.64	150,881.64
<b>Wyoming:</b>						
Riverton.....	482,740.82	3,427,107.01	25,537.97	77,901.92	457,202.85	3,849,205.09
Shoshone.....	148,029.98	10,340,014.37	101,881.83	1,485,373.55	46,148.15	8,854,640.82
<b>Secondary</b>	93,697.64	2,270,709.18	58,058.89	713,988.86	35,638.75	1,556,720.32
<b>Denver office (net not transferred to projects) <sup>4</sup></b>	* 527.27	232,567.57	1,974.36	179,564.43	* 2,501.63	53,003.14
<b>Field legal (net not transferred to projects) <sup>4</sup></b>	* 935.53	8,725.96	40.63	7,434.75	* 976.16	1,291.21
<b>Washington office (net not transferred to projects) <sup>4</sup></b>	147,210.45	503,652.86	2,207.96	233,079.55	145,002.49	170,573.31
<b>Adjustments, surveys, subsection K.....</b>	44,151.19	85,464.58			44,151.19	85,464.58
<b>Indian projects <sup>5</sup></b>		2,997,829.24		2,997,829.24		

<sup>1</sup> Expenditures from following funds: Reclamation fund; increase of compensation; judgments, Court of Claims; Rio Grande Dam appropriation; Wind River Indian (Riverton); drainage and cut-over; general investigations, Reclamation Service, 1923-Dec. 31, 1924; and Yuma auxiliary fund. (See Table 17.) Amounts given for each project include net transfers (transfers from other projects less transfers to other projects).

<sup>2</sup> Collections creditable to increase of compensation, Rio Grande Dam appropriation, Wind River Indian (Riverton), drainage and cut-over, and general investigations, Reclamation Service, 1923-Dec. 31, 1924, are included in the expenditure column as contra.

<sup>3</sup> Decrease.

<sup>4</sup> For analysis, see Table 18.

<sup>5</sup> Expended for Bureau of Indian Affairs from reclamation fund and later reimbursed by congressional appropriation.

TABLE 16.—*Voucher transactions, all funds and net investments, as of June 30, 1926—Continued*

State and project	Expenditures		Collections		Net investment	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
Civil-service retirement fund (unabsorbed) <sup>1</sup> .....	\$2,007.22	\$4,922.02			\$2,007.22	\$4,922.02
Drainage and cut-over.....		100,544.02				100,544.02
General investigations.....	<sup>1</sup> 33,822.34	262,675.19		\$26,108.30	<sup>1</sup> 33,822.34	236,571.80
Total.....	8,906,138.07	214,126,532.21	6,627,038.43	66,848,012.35	2,279,099.64	147,278,519.86

<sup>1</sup> Decrease.<sup>2</sup> Analysis of civil-service retirement fund:

Transferred from reclamation fund to civil-service retirement fund..... \$143,785.00  
 Deducted from pay of employees..... 138,862.98

Unabsorbed balance..... 4,922.02

TABLE 17.—*Voucher transactions, all funds and net investment, as of June 30, 1926; analysis by funds*

Item	Expenditures		Collections		Net investment	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
Reclamation fund.....	\$8,903,442.74	\$206,217,328.09	\$6,600,699.29	\$65,901,399.88	\$2,302,743.45	\$142,225,923.21
Increase of compensation (net).....	.66	2,797,960.33			.66	2,797,960.33
Judgments, Court of Claims.....	2,525.04	597,461.24			2,525.04	597,461.24
Rio Grande Dam appropriation (net).....		1,000,000.00				1,000,000.00
Wind River Indian (Riverton) (net).....		359,176.04				359,176.04
General investigations, Reclamation Service, 1923-Dec. 31, 1924, fund (net).....	37.77	266,235.16			37.77	266,235.16
Yuma auxiliary project fund.....	131.86	788,561.27	26,339.14	856,612.47	<sup>1</sup> 26,207.28	<sup>1</sup> 68,051.20
Drainage and cut-over fund (net).....		99,815.08				99,815.08
Total.....	8,906,138.07	214,126,532.21	6,627,038.43	66,848,012.35	2,279,099.64	147,278,519.86

<sup>1</sup> Contra.TABLE 18.—*Analysis of voucher transactions and net investment, general offices, as of June 30, 1926*

Item	Denver		Field legal		Washington	
	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926	Fiscal year 1926	To June 30, 1926
Reclamation fund disbursements.....	\$185,238.93	\$1,942,009.03	\$50,806.75	\$538,626.56	\$166,173.16	\$5,512,506.07
Less:						
Net transfers.....	185,766.20	1,709,441.46	51,742.28	629,900.60	18,962.71	5,000,853.21
Collections.....	1,974.36	179,564.43	40.63	7,434.75	2,207.96	333,079.85
Total.....	187,740.56	1,889,005.89	51,782.91	637,335.35	21,170.67	5,242,932.76
Net investment.....	<sup>1</sup> 2,501.63	53,003.14	<sup>1</sup> 976.16	1,291.21	146,002.49	170,573.31

<sup>1</sup> Contra.

TABLE 19.—Appropriations, by projects, for the fiscal year 1906, increases and decreases authorized, expenditures and liabilities, and balances unencumbered

State	Project	Appropriation acts	10 per cent increases and decreases	Contributed funds	Total authorized	Expenditures	Balance unexpended	Liabilities	Balance unencumbered
Arizona.....	Salt River.....	\$5,000.00			\$5,000.00		\$5,000.00		\$5,000.00
Do.....	Yuma-auxiliary.....	186,659.73			186,659.73	\$73,594.06	113,065.67	\$3,583.07	104,482.60
Arizona-California.....	Yuma.....	703,189.00			703,189.00	481,747.84	221,441.16	72,881.04	148,596.30
California.....	Oroville.....	84,000.00			84,000.00	60,598.81	23,401.19	27,092.94	6,320.55
Colorado.....	Grand Valley.....	273,000.00			273,000.00	113,664.25	159,335.75	7,944.62	129,388.43
Do.....	Uncompahgre.....	163,000.00	\$127,000.00		290,000.00	128,753.62	34,246.38	11,940.90	28,015.58
Idaho.....	American Falls.....	627,000.00		\$2,240,688.18	2,867,688.18	1,868,973.05	1,007,715.13	725,356.87	281,945.26
Do.....	Rose Hill.....	550,000.00			550,000.00	386,997.53	163,002.47	7,841.13	146,161.34
Do.....	King Hill.....	35,600.00	\$500.00		34,500.00	21,432.24	13,067.76	7,800.75	12,747.01
Do.....	Minidoka.....	170,000.00	35,000.00		205,000.00	142,054.56	62,945.44	22,274.90	40,670.54
Montana.....	Flathead.....	118,000.00			118,000.00	28,704.31	89,295.69	4,716.66	84,578.93
Do.....	Milk River.....	76,000.00			76,000.00	53,028.38	22,971.62	10,874.29	12,366.23
Do.....	Sun River.....	611,000.00		26.70	611,026.70	43,028.62	567,998.08	6,254.12	537,133.96
Montana-North Dakota.....	Lower Yellowstone.....	180,000.00			180,000.00	11,289.85	128,710.15	5,790.44	123,949.71
Nebraska-Wyoming.....	North Platte.....	1,607,133.90		41,777.57	1,699,911.47	1,222,733.26	477,178.21	312,376.46	164,801.75
Nevada.....	Newlands.....	912,000.00			912,000.00	124,055.26	787,944.74	13,055.89	774,887.85
New Mexico.....	Carlsbad.....	70,000.00			70,000.00	64,702.86	5,297.14	2,188.24	3,108.90
New Mexico-Texas.....	Rio Grande.....	660,000.00			660,000.00	566,576.70	103,423.30	86,996.74	16,223.46
North Dakota.....	Williston.....	25,000.00		19,766.90	44,766.90	28,242.79	1,757.21	1,611.71	1,145.50
Oregon.....	Umatilla.....	490,852.50			490,852.50	333.69	490,518.81	110,479.28	480,039.53
Do.....	Vale.....	500,000.00			500,000.00	548,816.48	291,183.52	11,414.30	489,566.78
Oregon-California.....	Klamath.....	501,000.00			501,000.00	17,493.27	483,506.73	11,28.31	390,833.17
Oregon-Idaho.....	Owyhee.....	310,494.84			310,494.84	20,006.03	290,488.81	9,990.44	200,498.36
South Dakota.....	Beale Fourche.....	165,000.00			165,000.00	54,966.20	110,040.80	1,406.16	100,144.64
Utah.....	Salt Lake Basin.....	1,263,066.75			1,263,066.75	21,716.61	1,241,350.14	1,406.16	1,239,943.98
Do.....	Strawberry Valley.....	39,000.00	500.00		39,500.00	37,474.87	2,025.13	821.23	1,503.90
Washington.....	Okanogan.....	70,000.00		9,500.00	79,500.00	68,578.12	9,921.88	6,690.14	2,261.74
Do.....	Yakima.....	295,000.00	10,000.00		305,000.00	277,084.58	27,915.42	15,690.42	11,455.00
Do.....	Yakima-Kittitas.....	2,790,000.00			2,790,000.00	36,654.10	2,753,345.90	15,980.24	2,769,326.08
Wyoming.....	Riverton.....	414,000.00	\$35,000.00		449,000.00	539,344.72	2,713,655.28	61,375.82	1,54,390.08
Do.....	Shoshone.....	108,325.26	\$34,000.00		142,325.26	124,996.56	25,000.44	11,372.62	243,627.62
Do.....	Adjustment surveys, subsection K.....	60,000.00			60,000.00	44,418.06	62,909.28	97.38	62,811.90
Total.....		\$15,708,704.01		\$9,457.50	\$18,090,919.86	\$7,441,948.84	\$10,587,971.02	\$1,562,592.26	\$9,025,378.76

Decreases.

Appropriations as follows—Continued.

Act of Jan. 20, 1925 (43 Stat. 755), unexpended balance.....

Act of Mar. 3, 1925 (43 Stat. 1165-1171).....

Act of Mar. 3, 1926 (43 Stat. 1166-1171), unexpended balance.....

Total.....

Act of Mar. 4, 1925 (43 Stat. 1330-1331), unexpended balance.....

Act of Mar. 3, 1926 (44 Stat. —).....

Total.....

\$473,659.73

2,322,133.90

15,708,704.01



## ENGINEERING DATA FOR PROJECTS ON COMPLETION

[The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams, and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canals they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress]

*Engineering data for projects when completed*

## RESERVOIRS

Projects	Name	Area	Capacity	Spillway			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
		<i>Acres</i>	<i>Acres-ft</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Arizona: Salt River	Roosevelt	18,300	1,637,300	377	240	113,000	150,000
Do	Mormon Flat	1,000	63,200	243	159	-----	150,000
Do	Horse Mesa	2,800	264,000	243	272	-----	150,000
Do	Cave Creek flood control	760	14,000	1,732	59	20,000	60,000
California: Orland	East Park	1,850	51,000	415	88	8,000	12,000
Colorado: Uncompahgre	Taylor Park	2,260	106,000	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Idaho:							
Boise	Deer Flat	9,835	177,000	None.	-----	-----	-----
Do	Arrowrock	2,860	280,000	402	247	15,000	40,000
Minidoka	Lake Walcott	11,850	150,000	2,285	42	40,000	60,000
Do	Jackson Lake	25,540	847,000	160	41	7,500	13,000
Do	American Falls	56,500	1,700,000	540	50	60,000	115,000
Montana:							
Milk River	Sherburne Lakes	2,000	78,000	160	68	1,200	8,000
Do	St. Mary Lakes	6,910	124,000	500	-----	20,500	20,000
Do	Nelson Reservoir	4,560	68,500	( <sup>1</sup> )	23	-----	-----
Do	Point of Rocks	180	830	740	8	10	700
Do	Chain Lakes	9,400	244,000	300	58	1,300	10,000
Sun River	Willow Creek	1,050	16,700	50	62.5	-----	2,000
Do	Gibson	1,360	105,000	314	170	-----	50,000
Do	Fishkum	415	3,523	Under control.	-----	-----	-----
Do	Muddy Creek	1,828	33,000	-----	80	284	( <sup>1</sup> )
Do	Benton Lake	9,300	144,000	Under control.	-----	-----	-----
Nebraska-Wyoming:							
North Platte	Pathfinder	22,700	1,070,000	605	184	40,000	-----
Do	Lake Alice	900	11,400	100	18	2,500	-----
Do	Lake Minatare	2,240	60,760	100	55	2,000	-----
Do	Winters Creek Lake	360	3,000	None.	-----	-----	-----
Do	Guernsey	2,336	72,700	750	45	-----	50,000
Nevada: Newlands	Lake Tahoe	120,000	120,000	128	95	-----	30,000
Do	Lahontan	10,000	273,600	500	6	2,500	-----
Do	Spanish Springs	5,600	150,000	80	112	18,800	30,000
New Mexico: Carlsbad	Avalon	970	7,000	80	89	1,600	1,600
Do	McMillan	6,600	45,000	1,026	21	86,000	120,000
New Mexico-Texas: Rio Grande	Elephant Butte	40,080	2,638,000	1,750	25.1-24.9	34,500	60,000
Oregon: Umatilla	Cold Springs	1,500	50,000	275	193	8,000	16,000
Do	McKay	1,600	75,000	330	90	6,000	6,000
Oregon-California: Klamath	Upper Klamath Lake	60,000	400,000	120	140	10,000	10,000
Do	Clear Lake	25,000	462,000	None.	-----	-----	-----
Do	Gerber	3,800	94,000	857	24	10,000	30,000
South Dakota: Belle Fourche	Belle Fourche	8,010	203,000	150	63	-----	10,000
Utah: Strawberry Valley	Strawberry Valley	8,370	253,000	214	100	2,000	2,000
Washington:							
Okanogan	Salmon Lake	240	10,500	58	48	-----	400
Do	Conconully	460	14,400	180	58	4,500	16,000

<sup>1</sup> Undetermined.

<sup>2</sup> 95,180 acre-feet only available; above fixed crest of spillway.

<sup>3</sup> Contract for smaller dam, with provision for increasing height if desired.

<sup>4</sup> Average flow of stream on which reservoir is located.

<sup>5</sup> No spillway; drainage limited; elevation is that of water surface.

<sup>6</sup> Consists of 8 siphons each 5 feet high and 10 feet wide at throat.

<sup>7</sup> One 80 by 50 foot Stoney gate; gate sill 45 feet above river bed.

<sup>8</sup> Two 64 by 14½ foot drum gates; top elevation 95 feet above river bed.

<sup>9</sup> At spillway level. Proposed to increase to 290,000 by adding 2 feet by movable crest.

## Engineering data for projects when completed—Continued

## RESERVOIRS—Continued

Projects	Name	Area	Capacity	Spillway			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
<b>Washington—Contd.</b>		<i>Acres</i>	<i>Acres-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Yakima	Bumping Lake.....	1,300	34,000	235	36	-----	6,000
Do.	Lake Clealum.....	4,680	501,000	420	112	-----	18,000
Do.	Lake Kachess.....	4,540	210,000	260	53	-----	7,200
Do.	Tieton.....	2,500	202,500	390	206	-----	50,000
Do.	Lake Keechelus.....	2,550	152,000	300	60	-----	10,000
Do.	Clear Creek.....	270	5,830	261	58	-----	-----
<b>Wyoming:</b>							
Riverton	Pilot Butte.....	882	30,000	100	-----	-----	500
Do.	Bull Lake.....	3,100	145,000	170	67	4,000	8,000
Shoshone	Shoshone.....	6,000	456,600	300	233	11,000	30,000
Do.	Ralston.....	200	2,100	-----	-----	-----	-----
Do.	Deaver.....	80	680	None.	-----	-----	-----
<b>Total.</b>		<b>518,026</b>	<b>13,862,123</b>				

## STORAGE DAMS

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
<b>Arizona: Salt River</b>	Roosevelt <sup>10</sup> .....	Rubble masonry arch, gravity.	294	1,125	342,325
Do.	Mormon Flat <sup>10</sup> .....	Concrete, variable radius arch.	225	664	43,500
Do.	Horse Mesa.....	do.	311	764	126,000
Do.	Cave Creek flood control. <sup>10</sup>	Reinforced concrete multiple arch.	109	1,732	18,774
California: Orland	East Park <sup>10</sup> .....	Concrete arch, gravity.	139	250	12,200
Colorado: Uncompahgre.	Taylor Park.....	Undetermined.	( <sup>11</sup> )	( <sup>11</sup> )	( <sup>11</sup> )
<b>Idaho:</b>					
Boise	Upper Deer Flat <sup>10</sup> .....	Earth fill.....	70	4,000	1,190,275
Do.	Lower Deer Flat <sup>10</sup> .....	do.	40	7,200	1,207,608
Do.	Deer Flat Forest <sup>10</sup> .....	do.	16	950	22,500
Do.	Arrowrock <sup>10</sup> .....	Rubble concrete arch, gravity.	349	1,100	585,130
<b>Minidoka</b>	Minidoka <sup>10</sup> .....	Rock fill, concrete core.....	96	937	242,500
Do.	Jackson Lake <sup>10</sup> .....	Massive concrete gate section and earth fill.	67	4,450	345,400
Do.	American Falls.....	(Concrete gravity.	87	3,100	170,000
		(Earth embankment.	75	1,900	150,000
<b>Montana:</b>					
Milk River	Sherburne Lakes <sup>12</sup> .....	do.	83	1,133	201,500
Do.	St. Mary Lakes.....	do.	30	2,000	134,000
Do.	Nelson <sup>10</sup> .....	do.	28	9,900	175,000
Do.	Point of Rocks <sup>10</sup> .....	do.	12.5	2,680	31,000
Do.	Connolly.....	do.	68	3,125	2,019,000
Do.	Willow Creek.....	Earth fill.....	72.5	525	196,400
Do.	Gibson.....	Concrete arch.....	205	882	160,000
Do.	Fishkun.....	Earth fill.....	19	2,270	28,474
Do.	Muddy Creek.....	do.	90	800	446,000
Do.	Benton Lake.....	do.	40	240	12,000
<b>Nebraska-Wyoming:</b>	Pathfinder <sup>10</sup> .....	Broken range masonry arch.	218	432	60,210
<b>North Platte.</b>					
Do.	Pathfinder Dike <sup>10</sup> .....	Earth fill.....	40	1,650	152,000
Do.	Upper Lake Alcee <sup>10</sup> .....	do.	30	3,100	240,000
Do.	Lower Lake Alcee <sup>10</sup> .....	do.	28	2,560	119,000
Do.	Minatare <sup>10</sup> .....	do.	65	3,700	570,000
Do.	Guernsey.....	Earth and rock fill.....	97	575	332,000

<sup>1</sup> Contract for smaller dam, with provision for increasing height if desired.<sup>10</sup> Completed.<sup>11</sup> Not designed.<sup>12</sup> Completed except permanent spillway.

*Engineering data for projects when completed—Continued*

## STORAGE DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Nevada: Newlands..	Lake Tahoe <sup>10</sup> .....	Concrete sluiceway regulator	14	109	425
Do.....	Lohontan <sup>10</sup> .....	Earth and gravel fill with concrete spillways.	124	1,400	770,000
Do.....	Spanish Springs.....	do.....	99	2,580	1,227,080
New Mexico: Carlsbad..	Avalon <sup>10</sup> .....	Earth and rock fill, concrete core.	50	1,380	168,778
Do.....	McMillan <sup>10</sup> .....	Earth and rock fill.....	55	2,070	150,744
New Mexico-Texas: Rio Grande.	Elephant Butte <sup>10</sup> .....	Rubble concrete, gravity.....	308	1,155	605,380
Do.....	Elephant Butte Dike <sup>10</sup> .....	Earth rock and fill.....	42	2,000	179,080
Oregon: Umatilla.....	Cold Springs <sup>10</sup> .....	do.....	98	3,800	788,500
Do.....	McKay.....	Earth and gravel fill.....	160	2,600	2,300,000
Oregon: California: Klamath.	Clear Lake <sup>10</sup> .....	Rock fill.....	33	790	56,000
Do.....	Link River <sup>10</sup> .....	Concrete.....	22	435	2,300
Do.....	Gerber <sup>10</sup> .....	Concrete arch.....	85	478	11,900
South Dakota: Belle Fourche.	Belle Fourche <sup>10</sup> .....	Earth fill.....	122	6,200	1,000,000
Utah: Strawberry Valley.	Indian Creek Dike <sup>10</sup> .....	Earth fill, reinforced concrete	37	1,311	101,107
Do.....	Strawberry Dam <sup>10</sup> .....	Earth fill, reinforced concrete core wall.	72	488	108,415
Washington: Okanogan.....	Salmon Lake <sup>10</sup> .....	Earth embankment.....	40	1,260	194,288
Do.....	Conconully <sup>10</sup> .....	Hydraulic earth fill.....	67	1,000	354,342
Yakima.....	Bumping Lake <sup>10</sup> .....	Earth fill.....	45	3,425	247,700
Do.....	Lake Cle Elum <sup>10</sup> .....	Earth and gravel fill.....	125	700	462,000
Do.....	Lake Kachess <sup>10</sup> .....	do.....	63	1,400	193,300
Do.....	Tieton.....	Earth and rock fill, concrete-core wall.	222	905	1,995,000
Do.....	Lake Keechelus <sup>10</sup> .....	Earth and gravel fill.....	70	6,500	639,000
Do.....	Clear Creek <sup>10</sup> .....	Single concrete arch.....	84	404	4,100
Wyoming: Riverton.	Pilot Butte No. 1 <sup>10</sup> .....	Earth embankment.....	40	1,380	133,900
Do.....	Pilot Butte No. 2 <sup>10</sup> .....	do.....	24	1,150	50,500
Do.....	Pilot Butte No. 3 <sup>10</sup> .....	do.....	12	3,400	19,200
Do.....	Bull Lake.....	do.....	75	3,300	600,000
Shoshone.....	Shoshone <sup>10</sup> .....	Rubble concrete arch.....	328	200	78,576
Do.....	Ralston <sup>10</sup> .....	Earth fill.....	50	2,200	24,740
Do.....	Deaver.....	do.....	14	1,300	30,300
Total.....					22,425,504

## DIVERSION DAMS

			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Arizona: Salt River..	Granite Reef <sup>10</sup> .....	Rubble concrete weir.....	38	1,000	40,000
Do.....	Power Canal <sup>10</sup> .....	do.....	123½	400	4,800
Do.....	Joint Head <sup>10</sup> .....	Concrete weir.....	10	600	1,740
Arizona - California: Yuma.	Laguna <sup>10</sup> .....	Indian weir, concrete and rock fill. <sup>10</sup>	19	4,780	441,723
California: Orland..	South Canal <sup>10</sup> .....	Concrete on piling, with rock fill.	20	900	2,685
Do.....	North side <sup>10</sup> .....	Concrete weir, with removable timber crest.	8	360	370
Do.....	East Park Feed Canal. <sup>10</sup>	Concrete arch.....	44	154	1,777
Colorado: Grand Valley.....	Colorado River Diversion. <sup>10</sup>	Masonry ogee weir with roller crest 10 to 15 feet high.	24	546	25,062
Uncompahgre.....	Gunnison <sup>10</sup> .....	Crib with rock fill and movable flashboards.	15½	237	3,200
Do.....	Montrose and Delta <sup>10</sup> .....	Timber weir with concrete apron sluiceway and cut-off wall.	6.8	68½	173
Do.....	Loutsenhizer <sup>10</sup> .....	Pile and timber weir.....	8	100	.....
Do.....	Selig <sup>10</sup> .....	Pile and timber weir with concrete sump.	6	95½	206
Do.....	Ironstone <sup>10</sup> .....	Pile foundation with timber deck and needle flashboards.	8½	58½	.....

<sup>10</sup> Completed.<sup>11</sup> Including spillway and approaches, 1,675 feet.<sup>12</sup> Including spillway, 619,000 cubic yards.<sup>13</sup> Present development, rock-fill timber crib; height, 11 feet; volume, 1,500 cubic yards.<sup>14</sup> Maximum height 40 feet from bottom of sheet piling to top of dam; water raised 10 feet.

## Engineering data for projects when completed—Continued

## DIVERSION DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
<b>Colorado—Contd.</b>			<i>Feet</i>	<i>Feet</i>	<i>Cubic yds.</i>
Uncompahgre.....	East <sup>10</sup> .....	Pile and timber weirs, movable flashboards.	(17)	144	
Do.....	Garnet <sup>10</sup> .....	Rock baskets, faced and surfaced with concrete.	6½	75	500
<b>Idaho:</b>					
Boise.....	Boise River <sup>10</sup> .....	Rubble concrete weir.....	45	14 246	21,750
Do.....	Black Canyon <sup>10</sup> .....	Concrete masonry.....	183	1,040	78,844
Minidoka.....	Minidoka <sup>10</sup> .....	Combined diversion and storage dam. (See Storage.)			
<b>Montana:</b>					
Milk River.....	Swift Current <sup>10</sup> .....	Earth and timber crib.....	13	2,800	86,700
Do.....	St. Mary <sup>10</sup> .....	Concrete.....	6.8	198	480
Do.....	Chinook <sup>10</sup> .....				
Do.....	Dodson <sup>10</sup> .....	Timber crib rock filled, concrete abutments, movable crest.	25	319	12,000
Do.....	Vandalia <sup>10</sup> .....	Reinforced concrete, automatic movable crest.	34	1,500	11,000
Sun River.....	Sun River <sup>10</sup> .....	Concrete masonry.....	132	212	6,200
Montana-North Dakota: Lower Yellowstone.	Lower Yellowstone <sup>10</sup> .....	Rock-filled, timber weir.....	12	700	14,500
Nebraska-Wyoming: North Platte.	Whalen <sup>10</sup> .....	Concrete weir.....	29	300	80,740
Do.....	Horse Creek <sup>10</sup> .....	do.....	12	100	220
Nevada: Newlands..	Truckee River <sup>10</sup> .....	16 concrete sluiceways.....	22	171	3,322
Do.....	Carson River <sup>10</sup> .....	23 concrete sluiceways.....	20	240	2,707
Do.....	Spanish Springs.....	Concrete overflow.....	22	250	2,140
New Mexico: Carlisbad.	Avalon <sup>10</sup> .....	Combined storage and diversion. (See Storage.)			
New Mexico-Texas: Rio Grande.	Leasburg <sup>10</sup> .....	Rubble concrete weir.....	10.8	600	2,413
Do.....	Mesilla <sup>10</sup> .....	do.....	16.7	308	2,876
Do.....	Mexican <sup>10</sup> .....	Rubble masonry.....	4.7	320	1,200
Do.....	Percha <sup>10</sup> .....	Rubble concrete.....	17	350	4,346
Oregon: Umatilla..	Feed Canal (Echo) <sup>10</sup> .....	Concrete weir on timber crib.	2½	400	296
Do.....	Maxwell Canal <sup>10</sup> .....	do.....	2.3	175	43
Do.....	Three-Mile Falls <sup>10</sup> .....	Concrete multiple arch.....	24	800	4,160
Oregon - California: Klamath.	Lost River <sup>10</sup> .....	Hollow reinforced concrete..	40	290	5,550
Do.....	Lower Lost River <sup>10</sup> .....	Reinforced concrete.....	15	204	625
Do.....	Malone <sup>10</sup> .....	Earth, with concrete spillway.	30	515	18,500
Do.....	Miller <sup>10</sup> .....	do.....	12	290	1,000
South Dakota: Belle Fourche.	Diversion <sup>10</sup> .....	Concrete weir.....	23	400	12,149
Utah: Strawberry Valley.	Spanish Fork <sup>10</sup> .....	do.....	17	40	1,282
Do.....	Indian Creek Crossing. <sup>10</sup> .....	Earth.....	17	1,300	15,183
<b>Washington:</b>					
Okanogan.....	Salmon Creek <sup>10</sup> .....	Concrete weir.....	4½	50	132
Yakima.....	Sunnyside <sup>10</sup> .....	Concrete ogee weir.....	8½	500	2,291
Do.....	Tieton Diversion <sup>10</sup> .....	Concrete and rock-filled crib.	3	110	334
Do.....	Kittitas.....	Concrete gravity, with ogee river section.	65	248	5,500
<b>Wyoming:</b>					
Riverton.....	Wind River <sup>10</sup> .....	Concrete weir with earth embankment.	37	2,285	123,860
Shoshone.....	Corbett <sup>10</sup> .....	Reinforced concrete weir.....	18	400	4,951
Do.....	Willwood <sup>10</sup> .....	Concrete gravity, with ogee weir section.	60.5	320	22,119
<b>Total.</b>					1,073,347

<sup>10</sup> Completed.<sup>11</sup> Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.<sup>12</sup> Length, including logway.<sup>13</sup> Will be constructed by irrigation districts. No data available as to type and dimensions.<sup>14</sup> Constructed by Mexican authorities and used jointly.

*Engineering data for projects when completed—Continued*

## IRRIGABLE AREA, PRESENT STATUS

(Subject to revision after final classification of land)

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	With-drawn			Rail-road, unsold	Other	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona:								
Salt River	19,867						216,133	236,000
Gravity system	13,412						216,133	229,545
Pumping system	6,455							6,455
Arizona-California: Yuma	15,416	2,859	34,205		8,215		51,447	112,142
Arizona—								
Valley	5,974		1,800				44,450	52,224
Mesa	3,460	2,859	31,884				6,797	45,000
California—Reservation	5,982		521		8,215		200	14,918
California: Orland—Main							20,659	20,659
Colorado:								
Grand Valley	13,530	361	8,494				28,115	50,500
Garfield gravity	11,530	361	4,994				15,115	32,000
Garfield pumping	2,000		3,500				3,000	8,500
Orchard Mesa pump-								
ing							10,000	10,000
Uncompahgre	18,498	1,870	674				73,777	94,819
South	2,270	359	37				6,177	8,843
West	2,167		12				3,942	6,121
Montrose and Delta	5,096	80	31				22,572	27,779
Loutsenhizer	218	37					6,254	6,509
Selig	3,920	793	480				7,265	12,458
Ironstone	1,140	176	20				16,340	17,676
East	3,679	425	94				8,612	12,810
Garnet	8						2,615	2,623
Idaho:								
Boise	67,588		5,560	5,980			274,570	353,698
Arrowrock (Idaho)	66,382			60			203,379	269,821
Arrowrock (Oregon)	1,206						3,697	6,903
Notus							6,874	6,874
Hillcrest			2,230				11,870	14,100
Payette			3,330	5,920			46,750	56,000
King Hill				335			16,533	16,868
Minidoka	96,080	639	106,840	8,999			24,016	236,574
Pumping	30,258			788			17,914	48,960
Gravity	65,822	639		371			5,782	72,614
North side pumping								
extension			106,840	7,840			320	115,000
Montana:								
Huntley	26,189		2,592		313		3,432	32,526
Gravity	21,248		2,007		313		3,432	27,000
Pumping	4,941		585					5,526
Divisions—								
Pryor	23,525		1,889		135		2,847	28,396
Eastern	925		42		178		585	1,730
Fly Creek	1,739		661					2,400
Milk River	27,084		9,751	4,309			84,536	125,680
Chinook division	171		808	573			42,278	43,830
Malta division	20,955		8,523	2,718			27,640	59,836
Glasgow division	5,958		420	1,018			14,618	22,014
Sun River	38,398	429	33,863	5,119			29,124	106,933
Sun River Slope	655		13,341	969			3,213	18,178
Big Coulee				356			1,934	2,290
Greenfields	22,071		18,768	3,640			20,184	64,663
Mill Coulee	4,197		1,543				2,160	7,900
Fort Shaw	11,475	429	211	154			1,633	13,902
Montana-North Dakota:								
Lower Yellowstone	13,546		2,067	986		95	42,655	59,349
Montana	6,899		1,060	846		95	30,128	39,028
North Dakota	6,647		1,007	140			12,527	20,321
Divisions—								
Gravity	13,286		2,011	704		50	40,990	57,041
Pumping	260		56	282		45	1,665	2,398
Nebraska-Wyoming:								
North Platte	136,816		11,442	2,045			87,621	237,924
Interstate division	83,697		1,143	529			29,264	114,633
Nebraska	81,086		1,143	529			28,985	111,743
Wyoming	2,611						279	2,890
Fort Laramie division	45,691		10,004	1,477			49,908	107,075
Nebraska	10,493		5,036	246			38,884	54,659
Wyoming	35,198		4,968	1,231			11,019	52,416
Northport division—								
Nebraska	7,428		295	39			8,454	16,216

<sup>11</sup> Includes 320 acres of vested rights and 171 acres of town and school sites.

*Engineering data for projects when completed—Continued*

## IRRIGABLE AREA, PRESENT STATUS—Continued

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	Withdrawn			Rail-road, unsold	Other	
<b>Nevada:</b>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Newlands.....	25,315	21	21,965	100	15,377	8,331	44,001	116,000
Carson division.....	21,550	21	11,912	-----	4,877	2,500	30,140	80,000
Spanish Springs division.....	3,765	-----	10,053	100	10,500	5,731	5,851	36,000
New Mexico: Carlsbad.....	45	-----	-----	-----	-----	-----	25,010	25,055
<b>New Mexico-Texas:</b>								
Rio Grande.....	1,500	100	700	1,000	-----	-----	151,700	155,000
New Mexico.....	1,500	100	700	1,000	-----	-----	87,700	91,000
Texas.....	-----	-----	-----	-----	-----	-----	64,000	64,000
Divisions—								
Rincon.....	-----	30	-----	700	-----	-----	15,900	17,000
Leasburg.....	600	40	640	200	-----	-----	29,950	31,000
Mesilla.....	900	40	60	100	-----	-----	45,850	47,000
El Paso.....	-----	-----	-----	-----	-----	-----	56,000	56,000
Unallocated.....	-----	-----	-----	-----	-----	-----	5,000	5,000
<b>Oregon:</b>								
Umatilla.....	5,413	-----	2,376	-----	-----	3,319	17,192	28,300
East division.....	3,030	-----	-----	-----	-----	1,407	12,563	17,000
West division.....	2,883	-----	2,376	-----	-----	1,912	4,629	11,300
<b>Oregon-California: Klamath.</b>	<b>5,820</b>	<b>-----</b>	<b>20,875</b>	<b>-----</b>	<b>-----</b>	<b>-----</b>	<b>140,682</b>	<b>167,377</b>
Oregon.....	2,986	-----	1,285	-----	-----	-----	103,194	107,355
California.....	2,884	-----	19,590	-----	-----	-----	37,548	60,022
Divisions—								
Main.....	2,732	-----	-----	-----	-----	-----	39,168	41,900
Tule Lake.....	3,088	-----	20,875	-----	-----	-----	287	34,200
Pumping.....	-----	-----	-----	-----	-----	-----	20,595	20,595
Langell Valley.....	-----	-----	-----	-----	-----	-----	20,782	20,782
Bonanza Springs.....	-----	-----	-----	-----	-----	-----	5,900	5,900
Lower Klamath Lake.....	-----	-----	-----	-----	-----	-----	54,000	54,000
<b>South Dakota: Belle Fourche.</b>	<b>37,695</b>	<b>37</b>	<b>4,508</b>	<b>2,462</b>	<b>-----</b>	<b>-----</b>	<b>44,063</b>	<b>83,765</b>
<b>Utah: Strawberry Valley.</b>	<b>2,003</b>	<b>-----</b>	<b>-----</b>	<b>-----</b>	<b>-----</b>	<b>-----</b>	<b>51,886</b>	<b>53,889</b>
High Line.....	2,008	-----	-----	-----	-----	-----	19,853	21,856
Spanish Fork.....	-----	-----	-----	-----	-----	-----	22,033	22,033
Springville-Mapleton.....	-----	-----	-----	-----	-----	-----	10,000	10,000
<b>Washington:</b>								
Okanogan.....	116	-----	-----	-----	-----	-----	7,184	7,300
Gravley.....	-----	-----	-----	-----	-----	-----	-----	5,825
Pumping.....	-----	-----	-----	-----	-----	-----	-----	1,125
<b>Yakima.....</b>	<b>7,358</b>	<b>-----</b>	<b>14,261</b>	<b>6,494</b>	<b>241</b>	<b>24,522</b>	<b>288,854</b>	<b>341,700</b>
Sunnyside.....	2,627	-----	-----	30	241	-----	104,702	107,600
Tieton.....	2,048	-----	-----	4	-----	-----	29,948	39,000
Kittitas.....	-----	-----	5,523	1,961	-----	6,729	57,777	72,000
Roe.....	120	-----	1,623	2,067	-----	11,310	43,330	58,350
Moxee.....	1,663	-----	775	1,832	-----	2,783	30,197	36,760
Kennewick.....	900	-----	6,469	1,100	-----	3,700	22,900	35,000
<b>Wyoming:</b>								
Riverton.....	-----	-----	60,000	-----	1,000	-----	30,000	100,000
Shoshone.....	51,602	4,154	131,630	17,671	-----	716	8,550	214,323
Montana, Frannie division.....	86	-----	-----	4	-----	-----	-----	90
<b>Wyoming—</b>								
Garland division.....	37,542	1,280	478	252	-----	-----	2,362	41,923
Frannie division.....	13,974	2,865	8,852	315	-----	716	1,188	27,910
Willwood division.....	-----	-----	14,600	500	-----	-----	500	15,600
Heart Mountain division.....	-----	-----	33,100	3,200	-----	-----	2,500	38,800
Oregon Basin division.....	-----	-----	74,600	13,400	-----	-----	2,000	90,000
<b>Total.....</b>	<b>609,379</b>	<b>10,470</b>	<b>480,773</b>	<b>55,500</b>	<b>25,146</b>	<b>36,883</b>	<b>1,762,750</b>	<b>2,981,461</b>

\* Includes some public land, but distribution not known.

## SUMMARY OF CONSTRUCTION RESULTS TO JUNE 30, 1926

Items	To June 30, 1926	To June 30, 1925	Increase
Reservoir capacity available (original).....	<i>Acres-feet</i> 10,498,153	<i>Acres-feet</i> 10,325,053	<i>Acres-feet</i> 173,100
<b>CANALS, DITCHES, AND DRAINS</b>			
Canals over 800 second-feet capacity.....	<i>Miles</i> 517.5	<i>Miles</i> 517.5	<i>Miles</i> 0
Canals 301 to 800 second-feet capacity.....	718.2	712.6	5.6
Canals 50 to 300 second-feet capacity.....	2,316.9	2,305.3	10.6
Canals less than 50 second-feet capacity.....	9,460.0	9,310.9	149.1
Total canals.....	13,011.6	12,846.3	165.3
Waste water ditches.....	1,043.3	1,029.6	13.7
Drains, open.....	1,754.9	1,690.5	64.4
Drains, closed.....	213.3	213.2	.1
Total.....	3,011.5	2,933.3	78.2
Grand total.....	16,023.1	15,779.6	243.5
<b>TUNNELS</b>			
Number.....	106	106	0
Length (feet).....	152,345	152,345	0
<b>STORAGE AND DIVERSION DAMS</b>			
Masonry.....	<i>Cubic yards</i> 2,357,559	<i>Cubic yards</i> 2,274,659	<i>Cubic yards</i> 82,900
Earth.....	15,135,508	14,341,608	793,900
Rockfill and crib.....	1,728,175	1,725,775	2,400
Total.....	19,221,242	18,342,042	879,200
<b>DIKES AND LEVEES</b>			
Length and volume.....	<i>Feet</i> 1,090,243	<i>Feet</i> 1,069,079	<i>Feet</i> 21,164
	<i>Cu. yds.</i> 5,714,213	<i>Cu. yds.</i> 5,554,163	<i>Cu. yds.</i> 160,050
<b>CANAL STRUCTURES</b>			
Costing over \$2,000.....	<i>Concrete</i> 1,512	<i>Concrete</i> 1,461	<i>Concrete</i> 51
Costing \$500 to \$2,000.....	<i>Wood</i> 3,370	<i>Wood</i> 3,188	<i>Wood</i> 182
Costing \$100 to \$500.....	<i>Concrete</i> 17,954	<i>Concrete</i> 17,296	<i>Concrete</i> 668
Costing less than \$100.....	<i>Wood</i> 31,383	<i>Wood</i> 31,325	<i>Wood</i> 558
Total.....	54,719	53,260	1,459
Grand total.....	142,581	141,163	2,718
<b>BRIDGES</b>			
Steel.....	<i>Number</i> 112	<i>Number</i> 112	<i>Number</i> 0
Combination.....	<i>Length</i> 430	<i>Length</i> 422	<i>Length</i> 8
Wood.....	10,094	9,781	313
Concrete.....	383	368	20
Total.....	11,019	10,673	341
<b>CULVERTS</b>			
Concrete.....	3,506	3,329	177
Metal.....	2,642	2,416	226
Terra cotta.....	2,064	2,079	15
Wood.....	4,285	4,268	22
Total.....	12,527	12,081	446
<b>PIPE</b>			
Concrete.....	<i>Linear feet</i> 1,025,062	<i>Linear feet</i> 966,431	<i>Linear feet</i> 38,621
Metal.....	363,515	345,553	17,962
Terra cotta (tile).....	1,631,090	1,629,865	1,225
Wood.....	686,738	674,076	12,662
Total.....	3,706,395	3,635,925	71,070

## Summary of construction results to June 30, 1926—Continued

Items	To June 30, 1925		To June 30, 1926		Increase	
	Number	Length	Number	Length	Number	Length
FLUMES						
Concrete.....	103	<i>Feet</i> 73,348	101	<i>Feet</i> 72,250	2	<i>Feet</i> 1,098
Metal.....	1,712	225,599	1,667	212,982	45	12,617
Wood.....	2,658	506,045	2,623	502,558	35	3,487
Total.....	4,473	804,992	4,391	787,790	82	17,202
CANALS LINED						
	Concrete	Wood	Concrete	Wood	Concrete	Wood
Length (miles).....	454.50	4.12	429.57	4.12	24.93	0
Total.....	458.62		433.69		24.93	
BUILDINGS						
	<i>Number</i>		<i>Number</i>		<i>Number</i>	
Offices.....	101		101		0	
Residences.....	731		730		1	
Power plants.....	34		33		1	
Pumping stations.....	197		178		19	
Barns, storehouses, etc.....	575		575		0	
Total.....	1,638		1,617		21	
WELLS						
	Number	Depth	Number	Depth	Number	Depth
Number and depth.....	681	<i>Feet</i> 72,347	640	<i>Feet</i> 66,195	41	<i>Feet</i> 6,152
COMMUNICATIONS						
	<i>Miles</i>		<i>Miles</i>		<i>Miles</i>	
Roads.....	1,075.25		1,049.78		25.47	
Railroads.....	83.00		83.00		0	
Telephone lines.....	3,350.30		3,349.00		1.3	
Transmission lines.....	1,676.00		1,652.43		23.57	
Total.....	6,184.55		6,134.21		50.34	
POWER DEVELOPED						
Water and steam, horsepower.....	81,068		75,079		6,989	
EXCAVATION						
	<i>Cubic yards</i>		<i>Cubic yards</i>		<i>Cubic yards</i>	
Class 1—Earth.....	228,130,109		222,080,628		5,449,481	
Class 2—Indurated material.....	12,908,601		12,721,287		187,314	
Class 3—Rock.....	10,577,756		10,412,066		165,690	
Total.....	251,616,466		245,814,981		5,801,885	
Riprap (cubic yards).....	2,407,545		2,407,545		0	
Paving (square yards).....	986,762		987,585		11,177	
Concrete (cubic yards).....	3,716,275		3,533,721		182,554	
Cement (barrels).....	3,937,565		3,670,211		267,354	



## DRAINAGE

*Estimate of seepage and summary of drainage work to June 30, 1926*

State and project	Constructed drains <sup>1</sup>		Estimated area damaged by seepage on June 30, 1926	Estimated area protected by constructed drains	Estimated area that will be protected when all drains authorized have been constructed
	Open	Closed			
	Miles	Miles	Acres	Acres	Acres
Arizona: Salt River <sup>1</sup> .....	15.85	5.30		60,000	60,000
Arizona-California: Yuma—					
Reservation.....	11.70	4.00		8,000	8,000
Yuma Valley.....	37.30		500	31,500	50,000
Colorado: Grand Valley—					
Project lands.....	43.25	.48	800	6,000	6,500
Grand Valley drainage district.....	38.30	1.00	29,000	10,000	10,000
Teller Institute.....	2.80			300	300
Frey drain.....	1.60			300	300
Orchard Mesa.....	13.07	.24	100	2,000	2,000
Uncompahgre <sup>1</sup> .....		98.00	17,000	9,700	9,700
Idaho: Boise—					
Riverside irrigation district.....	44.10		350	11,400	11,400
Pioneer irrigation district.....	78.50	.40	300	30,000	30,000
Nampa-Meridian irrigation district.....	45.78		400	51,000	51,000
Other parts.....	76.10	.20	2,500	26,000	31,000
King Hill.....	.88		180	800	800
Minnesota—					
Gravity division.....	112.00		1,200	30,000	30,000
Pumping division.....			2,000		
Montana: Huntley.....	16.73	50.50	1,200	21,500	21,500
Milk River—					
Malta division.....	2.30		2,300	300	300
Glasgow division.....			200		
Sun River—					
Fort Shaw division.....			2,974		
Greenfields division.....	21.40		340	11,600	15,000
Montana-North Dakota:					
Lower Yellowstone.....	6.10	1.10	6,500	1,700	1,700
Nebraska-Wyoming: North Platte—					
Interstate division.....	41.84	12.48	2,200	8,000	8,000
Interstate division <sup>1</sup> .....	57.10				
Fort Laramie division <sup>1</sup> .....	131.60		700	10,000	20,000
Northport division.....	8.42		200	2,500	2,500
Nevada: Newlands—					
Carson division.....	161.08	3.99		77,300	<sup>1</sup> 91,392
Truckee division.....	10.84			3,470	<sup>1</sup> 13,940
New Mexico: Carlsbad.....	11.14	3.65	5,200	5,140	5,140
New Mexico-Texas: Rio Grande—					
Rincon division <sup>1</sup> .....	34.34		160	12,850	16,000
Leasburg division <sup>1</sup> .....	66.34		3,000	31,000	31,000
Mesilla division <sup>1</sup> .....	119.87		5,950	47,000	50,000
El Paso division <sup>1</sup> .....	122.74		9,000	53,000	58,000
Oregon: Umatilla.....	14.30	.20	1,200	3,500	3,500
Klamath—					
Main division.....	103.00	8.00	2,000	28,700	30,000
Tule Lake division.....	56.00		1,500	10,000	24,000
South Dakota: Belle Fourche.....			10,000		
Utah: Strawberry Valley <sup>1</sup> .....	18.90	71.60	8,500	11,422	19,922

<sup>1</sup> Surface drains and waste ditches not included.<sup>2</sup> Drainage is largely by means of pumps, water recovered being used for irrigation purposes.<sup>3</sup> Constructed by landowners, water users, or drainage districts.<sup>4</sup> Outlet channels, of which 29.08 miles were built by the United States partly under cooperative contracts, 21.67 miles by the Farmers irrigation district, 2 miles by the Morrill drainage district, and 4.25 miles by drainage district No. 1.<sup>5</sup> Includes 67.06 miles of outlet channels, of which 56.68 miles were built by the United States as a part of the project canal, wasteway and drainage system, and 10.4 miles by the United States under cooperative contracts with the Gering irrigation district.<sup>6</sup> Area benefited.<sup>7</sup> Abandoned temporary outlets not included.

*Estimate of seepage and summary of drainage work to June 30, 1926—Continued*

State and project	Constructed drains		Estimated area damaged by seepage on June 30, 1926	Estimated area protected by constructed drains <sup>a</sup>	Estimated area that will be protected when all drains authorized have been constructed
	Open	Closed			
<b>Washington: Yakima—</b>	<i>Miles</i>	<i>Miles</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Sunnyside division <sup>a</sup> .....	82.85	95.07	9,000	51,298	51,298
Tieton division <sup>a</sup> .....	7.50	2.30	200	2,400	2,400
<b>Wyoming: Shoshone—</b>					
Garland division.....	105.05	111.81	3,000	32,000	32,000
Frannie division.....	79.40		900	11,000	11,000
Willwood division.....	11.14			3,000	3,000
<b>Total.....</b>	<b>1,811.20</b>	<b>470.22</b>	<b>130,044</b>	<b>725,680</b>	<b>813,192</b>

<sup>a</sup> All drainage work done by county drainage engineer through drainage improvement districts.

## POWER AND PUMPING

*Power plants operated on Bureau of Reclamation projects during the fiscal year 1925-26*

Project	Name of plant	Outgoing line voltage	Station capacity	Number of units	Head	First cost of plant	Cost of operation and maintenance	Estimated depreciation	Cost per kilowatt-hour exclusive of depreciation	Distribution of kilowatt-hours generated				Total output	Gross power sales
										Sold to consumers	Used for irrigation purposes	Used for other purposes	Losses		
			Kv-a		Feet									Kilowatt-hours	
Boise	Black Canyon 1	66,000	10,000	2	80-88	\$408,000.00	\$5,000.00	\$7,000.00	\$0.0003					16,290,073	
	Boise River 1	22,000	1,875	3	28-30	187,905.37	4,000.00	5,540.00	.0015					2,745,110	\$6,630.00
Minidoka	Minidoka	33,000	7,000	5	44-49	455,317.40	18,674.94	15,000.00	.00040					17,914,000	29,290,880
	American Falls	33,000	1,540	3.36 and 45	45	76,975.00	7,487.59	5,040.00	.00147					5,098,850	108,196.40
Newlands	Lehontan 1	33,000	1,875	3	100	141,966.01	5,597.50	5,000.00	.001373						
Williston	Williston (stream electric)	22,000	1,150	4		175,000.00	( <sup>1</sup> )							4,077,480	15,539.45
North Platte	Lingle	33,000	1,750	4	107	186,683.34	39,829.07	18,630.00	.00713					5,593,680	103,242.59
Okanogan	Okanogan No. 1	6,600	187	1	108	11,923.44				4,293,560	116,400	296,610	887,120		
	Power Plant No. 2	6,600	187	1	55	13,931.42									
Rio Grande	Elephant Butte No. 2	2,300	187	1	147	8,440.50	1,968.00	283.00	.063					25,360	
Riverton	Plot Butte 1	33,000	1,000	1	90-110	147,405.00	7,904.07	8,729.00	.00717					1,312,300	10,862.47
Salt River	Arizona Falls 1	11,000	1,060	2	19	106,800.73	8,335.94	5,473.94	.003499	503,245		598,375	210,630	2,389,300	
	Chandler 1	11,000	600	1	40	91,960.84	8,070.15	4,960.54	.003872					2,061,336	
	Cross-Cut 1	40,000	5,250	6	111	755,147.29	25,550.76	37,757.36	.003203					7,977,000	
		11,000													
	Roosevelt 1	40,000	19,250	7	80-240	1,235,964.58	65,553.11	61,794.73	.0020616	42,279,839	24,427,367	2,602,398	14,767,031	31,797,450	754,469.07
	South Consolidated 1	40,000	2,000	2	34	103,136.60	9,499.36	8,156.98	.001822					5,213,800	
Shoshone	Mormon Flats 1	110,000	8,760	1	60-150	294,320.15	3,107.37	19,716.45	.0048					6,474,000	
Strawberry Valley	Shoshone	33,000	2,000	2	219.5	565,454.00	10,052.26	21,850.00	.01283	316,394		213,190	247,456	777,040	11,660.33
Yakima	Spanish Fork	11,000	1,000	2	123.5	60,724.80	18,960.32	3,033.72	.011	1,440,588		166,699	87,497	1,994,779	29,464.51
	Rocky Ford	6,600	187	1	73	23,000.00	3,000.68	1,066.40	.0043					693,000	
Yuma	Siphon Drop u.									693,000					

- 1 Under contract of Apr. 1, 1923, the output is delivered to Idaho Power Co. on exchange basis.
- 2 Leabontan plant under 10-year lease to Canyon Power Co., expires in 1934.
- 3 Sold in 1923 to M. S. Davidson.
- 4 92,900 kilowatt-hours purchased from Western Public Service Co. at a cost of \$5,674.30 charged to operation and maintenance, included in above figures.
- 5 Not operated fiscal year 1925-26.
- 6 Contract with F. H. Roberts transferred to Midwest Public Service Co., effective May 1, 1926.
- 7 All six power plants feed the same distributing system so that it is impossible to separate the amounts sold by each plant or the losses chargeable to each plant.
- 8 28,173,776 kilowatt-hours purchased. Total generated in 6 plants—55,902,880 kilowatt hours. Total power 84,076,658 kilowatt hours.
- 9 Outgoing line voltage 40,000 prior to Mar. 16, 1926, and 110,000 volts thereafter.
- 10 Plant first operated May 13, 1926.
- 11 Under construction.

## Pumping plants operated on Bureau of Reclamation projects during fiscal year 1925-26

Project	Name of plant	Type of units <sup>1</sup>	Plant capacity		Num- ber of units	Static lift  <i>Feet</i>	First cost of plant	Cost of operation and main- tenance	Estimated depre- ciation	Energy used for pumping  <i>Kilowatt- hours</i>	Acre-feet pumped	Cost per acre-foot without depre- ciation	
			Horse- power	Second- feet								Per acre- foot	Per foot lift
Boise Grand Valley Huntley	Black Canyon <sup>1</sup>	V. T. D. S.	1,244	245	2	285	\$109,213.15	\$4,950.00	\$3,250.00	90,944	\$0.055	\$0.0019	
	Price Sub.	V. T. D. C.	125	25.3	1	31	46,697.83	460.00	1,000.00	5,212	.00284	.0016	
	Ballantine	do.	620	46	2	45	73,833.32	897.98	2,000.00	13,385	.0087	.0029	
	Ballantine auxiliary	O. E. D. C.	400	46	2	45	71,103.56	1,428.28	3,500.00	1,113	1.28	.0059	
	Dry Lake	V. T. D. C.	75	19.8	1	51	31,749.57	90.09	( <sup>3</sup> )	3,000	.03	.0071	
Klamath	Tule Lake No. 1	V. M. D. S.	120	60	2	6.1	23,117.70	2,861.98	1,000.00	160,920	6,606	.43	.071
	Tule Lake No. 2	do.	23	12	1	6.1	49,970.43	471.64	1,000.00	( <sup>3</sup> )	5,993	.0843	.0027
Lower Yellow- stone	Thomas Point	H. T. D. C.	220	40	2	31	49,970.43	471.64	1,000.00	( <sup>3</sup> )	5,993	.0843	.0027
	Pumping station No. 1	V. M. D. C.	3,800	816	5	30	184,920.06	33,406.74	19,080.00	11,638,838	245,649	.0694	.00196
Minidoka	Pumping station No. 2	do.	3,250	645	4	31	184,920.06	33,406.74	19,080.00	11,638,838	245,649	.0694	.00196
	Pumping station No. 3	do.	1,950	420	3	30	103,106.96	32,947.72	18,745.61	116,670,500	120,414	.0016	.00196
Boerch Lake <sup>1</sup>	Boerch Lake	do.	200	40	2	19.8	32,947.72	18,745.61	3,581.03	555,660	13,942	.0016	.00196
	West End <sup>1</sup>	H. M. D. C.	150	40	2	21.25	18,745.61	3,581.03	5,810.33	490,660	11,537	.0016	.00196
A-4 pumping station <sup>1</sup>	A-4 pumping station	Scoop wheel	25	20	1	4.8	3,328.42	3,634.71	3,634.71	45,735	11,537	.0016	.00196
	1817 pumping station <sup>1</sup>	do.	10	11	1	4.8	3,634.71	3,634.71	3,634.71	11,970	11,537	.0016	.00196
C-2 pumping station <sup>1</sup>	C-2 pumping station	do.	10	11	1	2.5	2,803.97	2,803.97	2,803.97	11,970	11,537	.0016	.00196
	114 pumping station <sup>1</sup>	H. M. D. C.	7.5	4	1	7	2,803.97	2,803.97	2,803.97	11,243	11,537	.0016	.00196
Williston	1812 pumping station <sup>1</sup>	do.	5.0	2	1	4	1,098.76	1,098.76	1,098.76	11,243	11,537	.0016	.00196
	Pumping station No. 1	S. T. D. C.	490	44.9	3	56 and 21.6	8,851.00	( <sup>4</sup> )	( <sup>4</sup> )	7,272	11,537	.0016	.00196
Newlands	Pumping station No. 2	H. M. D. C.	175	35	2	26.6	13,065.00	( <sup>4</sup> )	( <sup>4</sup> )	11,640	11,537	.0016	.00196
	Pumping station No. 3	do.	270	60	3	32	39,647.00	( <sup>4</sup> )	( <sup>4</sup> )	39,647.00	11,537	.0016	.00196
North Platte	Pumping station No. 4	do.	100	20	2	27.25	8,821.00	1,881.16	2,400.00	11,640	11,537	.0016	.00196
	Lehontan (temporary) <sup>1</sup>	do.	400	60	2	31.12	36,289.62	1,881.16	2,400.00	11,640	11,537	.0016	.00196
Okanogan	Dutch Flat drain No. 1	V. M. D. C.	30	2	1	52	23,363.94	3,165.83	2,400.00	116,400	1,007.1	3.14	.075
	Dutch Flat drain No. 2	do.	30	2	1	30	17,201.92	4,116.13	2,400.00	275,628	2,037	2.02	.033
Salt River <sup>10</sup>	Dutch Flat drain No. 3	do.	40	4	1	47	18,568.21	666.13	2,400.00	52,386	2,037	3.10	.066
	Duck Lake (new) <sup>1</sup>	H. M. D. C.	50	6	1	52-65	17,201.92	4,116.13	2,400.00	52,386	2,037	3.10	.066
Salt River <sup>10</sup>	Government wells Nos. 1 and 2 <sup>11</sup>	V. M. D. C.	30	2	2	61.25	18,568.21	666.13	2,400.00	52,386	2,037	3.10	.066
	Robinson Flat <sup>12</sup>	H. M. D. C.	400	12	2	177	30,077.24	13,500.72	2,400.00	821,293	2,251	6.00	.032
Salt River <sup>10</sup>	Salmon Lake <sup>13</sup>	G. E. D. C.	275	18	1	19.6-52.7	17,842.16	11,390.63	21.07	46,799	342	0.86	.0125
	Dobbins pumping plant	V. M. D. C.	75	4	1	68.8	17,842.16	11,390.63	21.07	46,799	342	0.86	.0125
Salt River <sup>10</sup>	Chandler division	(1) H. M. D. C. (2) V. M. D. C. (3) AND 8.	1,070	121	14	35.3	148,094.21	25,798.43	10,365.89	2,522,863	31,921	0.803	.0228

Phoenix City pump "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
High Line.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Tempe pumping plant.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Ness division.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Laaveen division "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Phoenix division.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Tempe division.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Salt River division.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
San Francisco.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Tollerson division.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Muskegon Garden.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Heard pumping plant "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Grandview "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Hillcrest "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Little Snipes Mountain "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Outlook "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Prosser "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Spring Creek "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Snipes Mountain "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
B lift "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Reservation.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Valley drainage "	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
West Yuma pumping.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35
Siphon Drop.	10	105	900	100	13	178	1,880	55	1,820	1,150	755	90	365	365	35	5	800	190	160	800	1,100	110	525	35

<sup>1</sup> Type V. M. D. C. = vertical motor driven centrifugal pump; type H. M. D. C. = horizontal motor driven centrifugal pump; type S. T. D. C. = steam turbine-driven centrifugal pump; type V. T. D. C. = vertical hydraulic turbine-driven centrifugal pump; type H. T. D. C. = horizontal hydraulic turbine-driven centrifugal pump; type O. E. D. S. = oil engine driven screw pump; type G. E. D. C. = gas engine driven centrifugal pump; type V. T. D. S. = vertical hydraulic turbine screw pump; type H. M. D. S. = horizontal motor-driven screw pump.

<sup>a</sup> Completed in 1924. Plant cost is field cost only.

**Turbine-driven.**  
 One of the best turbine-driven steel

Operated by local irrigation district.  
MCalendar year 1995

Sold to M. E. David

Operated 140 hours during

\* Power purchased from Washington P.

39,097 gallons distillate used in engine

<sup>11</sup> Pumping plant of city of Phoenix used.

iii Maintenance high due to destruction of plant by fire.

<sup>13</sup> Steam plant taken over by Salt River Valley Water Users Association without cost. Her-

<sup>19</sup> All quantities and costs estimated for June, 1926.  
<sup>20</sup> 20 500 gallons fuel oil used in engine.

20,000 gallons fuel oil used in engine.  
10 Gallons of gasoline.

**Appendix A**



Shoshone.....	Town of Powell, Wyo. C. B. & Q. R. R. Co. 7 small contracts.....	Sept. 26, 1923 June 1, 1923.....	Nov. 2, 1926 June 1, 1933.....	75 20 188	6 to 1 6 to 1	\$112.50 \$30	Each contract less than \$1,000.	7,421.42 1,606.80 2,633.61
Strawberry Valley	Spanish Fork City.....	May 1, 1925	Apr. 30, 1928	185	6 to $\frac{3}{4}$	\$740.		11,202.73
	Payson City.....	Feb. 4, 1925	Feb. 3, 1928	125	6 to $\frac{3}{4}$	\$500.		9,033.31
	Salem City.....	do.	do.	30	6 to $\frac{3}{4}$	\$120.		1,983.76
	Springville City.....	June 15, 1923	July 25, 1926	125	2 to 1	\$50		2,800.33
	Utah Packing Co.....	Jan. 1, 1926	Dec. 31, 1933	350	6 to $\frac{3}{4}$	\$525 and \$30.		3,482.30
	3 small contracts.....			17.5				1,420.02
							Do.	



## SETTLEMENT DATA, 1925

State and project	Irrigated farms		Towns		Number of schools, project and town	Number of churches
	Number	Population	Number	Population		
Arizona: Salt River <sup>1</sup> .....	7,000	41,000	12	57,000	67	66
Arizona-California: Yuma.....	1,404	3,640	5	8,600	14	15
California: Orland.....	690	1,694	1	1,700	9	7
Colorado:						
Grand Valley.....	455	1,075	6	11,246	24	33
Uncompahgre.....	1,784	6,092	3	7,400	29	27
Idaho:						
Boise.....	3,470	10,600	10	36,660	46	56
King Hill.....	187	625	4	1,818	6	5
Minidoka.....	2,286	7,237	6	7,070	23	23
Montana:						
Huntley.....	575	1,866	8	570	8	9
Milk River.....	251	936	15	8,106	21	25
Sun River.....	416	1,001	4	369	17	11
Montana-North Dakota: Lower Yellowstone.....	438	1,850	8	3,050	14	16
Nebraska-Wyoming: North Platte.....	2,509	6,978	18	18,900	102	69
Nevada: Newlands.....	761	2,549	5	2,400	11	9
New Mexico: Carlsbad.....	392	2,041	4	3,575	8	12
New Mexico-Texas: Rio Grande.....	4,442	20,583	34	122,178	76	139
Oregon: Umatilla.....	538	1,394	4	1,280	6	9
Oregon-California: Klamath.....	440	1,680	5	9,020	30	17
South Dakota: Belle Fourche.....	824	1,580	4	715	27	9
Utah: Strawberry Valley.....	2,742	6,500	12	16,200	26	28
Washington:						
Okanogan.....	463	1,267	3	3,000	6	9
Yakima-Sunnyside.....	3,326	10,206	11	7,525	41	30
Yakima-Tieton.....	1,320	3,490	8	26,700	10	4
Yakima-Kittitas.....			6	8,100	25	16
Wyoming:						
Riverton.....	1	1	3	2,300	3	3
Shoshone.....	816	1,997	5	1,258	7	8
Total.....	37,530	136,872	203	365,742	656	645

<sup>1</sup> Estimated.<sup>2</sup> Exclusive of Belle Fourche.

## Settlement data, 1925—Continued

State and project	Banks			
	Number	Capital stock	Deposits	Number of depositors
Arizona: Salt River <sup>1</sup> .....	15	\$1,600,000	\$30,000,000	42,000
Arizona-California: Yuma.....	4	180,000	2,859,200	8,700
California: Orland.....	2	171,000	1,090,000	2,970
Colorado:				
Grand Valley.....	5	382,000	4,000,000	10,000
Uncompahgre.....	6	505,136	3,499,208	11,250
Idaho:				
Boise.....	12	1,290,000	18,800,000	31,000
King Hill.....	1	20,000	1,286,315	1,960
Mindoka.....	5	280,000	1,398,000	4,000
Montana:				
Huntley.....	2	50,000	163,344	750
Milk River.....	13	490,000	4,761,300	9,500
Sun River.....	2	50,000	125,000	700
Montana-North Dakota: Lower Yellowstone.....	5	137,500	868,000	3,170
Nebraska-Wyoming: North Platte.....	20	607,500	7,700,000	19,150
Nevada: Newlands.....	1	75,000	975,273	1,750
New Mexico: Carlsbad.....	2	101,700	522,500	1,750
New Mexico-Texas: Rio Grande.....	11	2,750,000	20,277,000	45,000
Oregon: Umatilla.....	1	25,000	265,000	1,200
Oregon-California: Klamath.....	5	355,000	5,000,000	9,500
South Dakota: Belle Fourche.....	4	135,000	2,125,000	6,000
Utah: Strawberry Valley.....	5	235,000	1,750,000	8,350
Washington:				
Okanogan.....	4	140,000	1,358,000	2,400
Yakima-Sunnyside.....	9	260,000	2,751,693	8,997
Yakima-Tieton.....				
Yakima-Kittitas.....	6	375,000	4,440,000	10,360
Wyoming:				
Riverton.....	3	100,000	1,650,000	12,000
Shoshone.....	3	85,000	481,000	2,100
- Total.....	146	10,319,896	125,221,833	244,087

<sup>1</sup> Estimated.

## CROP STATISTICS

Summary of crop reports on Government reclamation projects in 1925—Area (acres)

State and project	Cereals					Other grain and seed					Hay and forage					Total			
	Barley	Corn, Indian	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sor-ghum grain	Flax seed	Mill seed	Total	Alfalfa hay	Clover hay	Other hay		Corn fodder	Other forage	Pasture
Arizona: Salt River	5,461				15,812	21,273							60,413		12,305	3,973	10,668	52,985	140,364
Arizona-California:																			
Yuma	212	8	18		499	737	12,457					12,457	16,414		255		14,806	4,416	35,891
Yuma Auxiliary (Mess)							2					2							
California: Orland	474	1,748	56		68	2,346							4,972		333	50	32	2,434	7,821
Colorado:																			
Grand Valley																			
Uncompagre	135	699	898		651	2,238	482					482	5,160	133	308	109	222	1,009	8,956
Idaho:																			
Boise	7,248	11,782	3,068	195	21,629	43,922	2,041	1,719	39		27	3,828	35,188	1,365	428	491	491	8,922	46,339
King Hill		141	326	76	47	2,297	382					2,409	3,720	40	3	11		5,235	9,009
Minidoka	6,428	3,371	2,927	10	14,049	24,805	387	2,264				2,651	40,186	1,296	98	272	40	5,164	50,066
Gravity division	3,434	3,066	1,999	10	6,645	14,147	239	702				941	24,223	2,905	96	54		5,188	30,368
Pumping division	2,994	3,315	1,928		8,421	12,658	148	1,562				1,710	15,963	491		218	40	2,976	19,668
Montana:																			
Huntley	553	765	1,262	25	3,701	6,306	194	52				246	5,578	39	46	128	4,456	1,122	11,369
Milk River	77	259	767	74	1,797	2,974	674			102		776	4,743		9,455	147	2,528	1,866	18,369
Sun River	872	63	1,422	17	14,035	16,409	197	96				295	7,769	80	343	160		1,351	9,703
Fort Shaw division	154	57	1,250	17	1,801	3,179	147	31				178	4,894	18	64	53		1,033	5,749
Greenfields and Big Coulee	718	6	1,172		13,284	15,130	50	67				117	3,185	62	282	107		318	3,964
Montana-North Dakota: Lower Yellowstone	398	865	269	46	981	2,559	147	10		211		377	5,322	88	181	420	6,962	658	13,021
Nebraska-Wyoming:																			
North Platte	15,828	41,890	13,233	1,185	16,890	88,966	135	497		154	135	921	29,283	1,177	2,602	585		5,377	38,974
Interstate division	9,926	21,224	3,645	777	1,624	37,196	54	465		62	62	21,057	1,089	1,089	460	385		3,213	26,204
Fort Laramie division	5,350	17,050	8,264	220	13,989	44,853	81	17		154	28	280	7,076	44	2,101	200		2,130	11,531
Northport division	5,582	3,556	1,294	188	1,327	6,917	15	15			45	60	1,100	44				34	1,219
Nevada: Newlands	893	3,378	67		4,780	6,068							26,271		2,686			32,063	64,020
New Mexico: Carlisle		61				61	1,880					1,880	4,311				1,363	20	5,904
New Mexico-Texas: Rio Grande	17	3,978	83		468	4,543	8		181			189	23,159		359			2,629	26,174
Oregon: Umatilla	52	250	4		129	435	107					107	9,140	20	73	81		2,746	12,060
Oregon-California:																			
Klamath	753		840	890	2,544	5,017									1,212			12,893	27,165
Main division	698		781	815	2,469	4,783									1,121			12,162	26,948
Tule Lake division	58		59		85	204									91			1,141	1,217

# ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

South Dakota: Belle Fourche...	1,082	10,698	5,254	55	2,906	20,025	921	94	1,015	20,721	53	1,806	403	82	7,814	30,867
Utah: Strawberry Valley...	680	20	1,536		6,267	8,503	68	25	93	13,773	24	314			1,111	15,386
Washington:																
Okanogan...		3								90		41	26		51	208
Yakima...	1,160	6,623	1,463		6,665	15,920			77	39,378		1,770	272	780	12,484	64,663
Sunnyside division...	638	5,402	1,123		4,860	12,023				32,588		1,279	142	542	9,904	44,405
Tieton division...	522	1,280	340		1,905	3,867			77	6,780		1,500	130	283	2,580	10,228
Wyoming:																
Shoshone...	973	138	2,964		2,985	7,010	137	717	854	24,753	48	80	43	2,143	16,802	48,668
Garland division...	947	60	2,050		2,428	5,484	107	511	618	21,042	37	46	23	1,718	14,483	37,361
Frammie division...	26	69	914		507	1,516	30	206	235	3,710	11	32	20	425	2,109	6,307
Riverton...		80				80										
Total	43,407	98,333	40,760	2,580	126,113	290,203	21,021	5,729	220	467	162	27,660	423,829	4,363	34,872	707,328

## Fruits and nuts

State and project	Beans	Onions	White potatoes	Sweet potatoes	Truck	Total	Apples	Peaches	Pears	Prunes	Citrus fruits	Small fruit	Miscellaneous	Total
Arizona: Salt River...	318	1,640	305		10,633	12,886					2,267	1,018	1,915	5,230
Arizona-California:														
Yuma...		17	1	90	1,617	1,725					1	64	136	201
Yuma Auxiliary (Mesa)			3		3	3					73	1	2	76
California: Orland...			5		85	90	3	50	18	354	274	274	1,805	2,778
Colorado:														
Grand Valley...	1,681		791		342	2,214		240						240
Uncompahgre...	1,062	2,126	5,154		425	8,797	1,640	93	9			59		1,810
Idaho:														
Boise...	284	267	2,583	26	567	3,747	974	25	21	389		87		1,496
King Hill...		6	143		168	306	251	10	21	12		10		394
Mindenoka...	1,740	32	6,945		946	9,563	190					27		217
Gravity division...	1,245	18	3,163		602	5,028	190					27		217
Pumping division...	495	14	3,782		244	4,535								
Montana:														
Huntley...	1,279	3	26		204	1,512								
Milk River...	36		150		57	222						3		2
Sun River...	7		237		83	327								
Fort Shaw division...	5		213		60	278								
Greenfields and Big Coulee...	2		24		23	49								
Montana-North Dakota: Lower Yellowstone...	698		128		892	1,718								
Nebraska-Wyoming:														
North Platte...	983	30	5,677		536	7,240								
Interstate division...	235		4,652		409	5,296								
Fort Laramie division...	738	39	987		112	1,844								
North Platte division...	17		60		12	77								

## Summary of crop reports on Government reclamation projects in 1925—Area (acres)—Continued

State and project	Vegetables and truck						Fruits and nuts													
	Beans	Onions	White potatoes	Sweet potatoes	Truck	Total	Apples	Peaches	Pears	Prunes	Citrus fruits	Small fruit	Miscellaneous	Total						
Nevada: Newlands.....		9	154		518	681	7							7						
New Mexico: Carlsbad.....			7		28	35							5	1,597						
New Mexico-Texas: Rio Grande.....	198	121	3	238	5,566	6,126	578	162	621	12		231		452						
Oregon: Umatilla.....			108		240	348	382	9	7			22		24						
Oregon-California: Klamath.....						936							24	24						
Idaho: Main division.....			815		121	936							24	24						
Idaho: Tule Lake division.....			794		110	904							24	24						
Idaho: Snake River division.....			21		11	32														
South Dakota: Belle Fourche.....			93		261	374														
Utah: Strawberry Valley.....	564	24	227		1,320	2,144	221	284	7			245	7	764						
Washington: Okanogan.....			21		66	87	4,038	15	40			32		4,125						
Washington: Yakima.....	465	55	8,383		2,924	11,857	15,528	1,398	3,409	569		1,303	192	22,309						
Washington: Sunnyside.....	319		7,478		2,753	10,550	8,423	713	1,680	569		1,020		12,414						
Washington: Tieton.....	176	55	905		171	1,307	7,105	685	1,720			283	192	9,965						
Wyoming: Shoshone.....	1,205		1,257		741	3,204	7							7						
Wyoming: Garland division.....	1,101		1,149		659	2,900	7							7						
Wyoming: Franke division.....	45		1,108		82	235														
Total.....	9,966	4,358	38,152	254	28,260	76,150	23,819	2,286	4,153	1,345	2,645	3,375	4,086	41,709						
State and project	Miscellaneous														Irrigated, no crop					
	Sugar beets	Cotton	Cane	Other	Total	Duplicated	Total cropped	Young alfalfa	Young fruit	Fall plowing	Miscellaneous	Duplicated	Total irrigated without crop	Total irrigated						
Arizona: Salt River.....		82,780		161	82,941	44,804	217,900				17,720		17,720	235,620						
Arizona-California: Yuma.....		83,468	8	1,508	34,994	30,165	55,770				130		130	55,900						
California: Yuma Auxiliary (Mesa).....		64		34	98	1,806	11,327	1,049	1,346		414	181	2,028	671						
California: Orland.....														13,965						



# ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

State and project	Cereals					Other grain and seed					Hay and forage							
	Barley	Corn	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flax seed	Millet seed	Total	Alfalfa hay	Clover hay	Other hay	Corn for deer	Other forage	Total
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Tons	Tons	Tons	Tons	Tons	Tons
Arizona: Salt River	193,410					474,360	667,770						294,186					376,063
Arizona-California:																		
Yuma	2,778	275	820		7,372	11,245	61,254					61,254	40,400		270		13,566	54,296
Yuma Auxiliary (Mesa)	15,400	92,320	1,680		1,285	110,685							17,794		560	261	632	19,247
California: Orland																		
Colorado:																		
Grand Valley		20,108	27,846		14,383	62,337	1,044					1,044	17,633		207			17,840
Uncompahgre	3,036	78,638	139,109	223	259,591	479,619	1,306	317				1,623	69,743	234	339	411	1,531	62,268
Idaho:																		
Boise	301,560	375,492	128,917	1,183	759,597	1,564,749	5,148	8,775	806		421	15,148	112,116	2,007	733		3,177	118,083
King Hill	6,637	9,824	3,080	575	9,607	20,723	608	150				755	13,399	105	239	1,458	10	13,628
Mindoka	246,553	104,828	128,122	56	505,918	983,207	1,147	10,086				11,233	117,373	2,246	239			121,236
Gravity division	125,383	96,952	88,714	56	192,854	504,069	692	4,202				4,894	74,338	1,768	239			76,896
Pumping division	121,170	7,576	37,438		312,964	479,146	455	5,884				6,339	42,915	478		1,233	10	44,636
Montana:																		
Huntley	18,143	15,904	45,210	461	90,159	169,877	347	188				535	15,109	51	129	160		16,449
Milk River	1,625	4,851	23,942	510	23,842	35,864	1,405			801		2,206	8,923		5,558	137	199	14,814
Sun River	15,667	1,700	36,142	193	197,328	251,030	210	679				769	13,507	162	388	182		14,289
Fort Shaw division	3,030	1,570	5,944	193	14,078	24,865	128	168				296	7,946	31	65	75		8,017
Greenfields and Big Coulee	12,637	130	30,148		183,250	226,165	82	411				493	6,761	131	273	107		6,372
Montana-North Dakota: Lower Yellow-stone	13,226	20,211	6,843	2,000	23,420	65,200	458	200		1,219		1,877	11,642	91	194	1,784		13,711
Nebraska-Wyoming:																		
North Platte	552,773	948,769	502,193	14,270	261,722	2,279,727	499	1,038			821	3,328	62,422	1,006	1,986	2,275		67,689
Interstate division	373,180	487,288	142,196	9,922	28,706	1,041,309	299	896			303	3,458	44,238	936	1,772			47,439
Fort Laramie division	190,605	390,773	320,819	3,174	213,083	1,097,454	200	62			282	1,534	15,910	20	1,576	508		18,009
Northport division	9,979	70,708	36,178	1,174	19,931	140,970		100			236	336	2,184	50	17			2,361
Nevada: Newlands	25,917		2,063		104,567	132,547	4,963						90,997		369			91,366
New Mexico: Carlisbad		560				560						4,893	8,395				711	9,105
New Mexico-Texas: Rio Grande		127,194	3,420		9,162	140,218	40					5,743	79,278		769			80,077
Oregon: Umatilla	1,466	6,563	46		2,562	10,637	236		5,708			5,743	23,966	45	73	421		24,565
Oregon-California:																		
Klamath	20,100																	
Main division			20,699	12,651	53,886	107,336							33,520		1,506			35,026
Tule Lake division	19,300		19,859	11,461	51,930	102,550							30,054		1,373			31,427
South Dakota: Belle Fourche	800		840	1,190	1,958	4,788							3,476		135			3,611
Utah: Strawberry Valley	26,411	288,588	218,981	3,162	67,879	615,021	767	158				925	33,722	51	1,641	870		36,304
	30,273	668	62,944		208,077	301,992	119	63				182	51,220	51	433	528		52,772

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State and project	Vegetables and truck						Miscellaneous			
	Beans	Onions	White potatoes	Sweet potatoes	Total	Sugar beets	Cotton	Cotton-seed	Cane	
Washington:										
Okanogan.....	150	150	336		336	124,939	107	127	402	
Yakima.....	285,612	631,877	336		336	3,442	3,442	1,135.0	138,719	
Sunnyside division.....	23,921	497,348	336		336	106,061	2,046	786	119,262	
Tieton division.....	17,864	134,529	336		336	106,061	2,046	786	20,467	
Wyoming:										
Shoshone.....	29,742	185,900	269	3,568	3,837	40,535	67	88	45,479	
Garland division.....	29,292	159,278	214	2,555	2,769	34,376	54	68	34,767	
Franklin division.....	450	38,622	55	1,013	1,068	6,189	13	20	10,712	
Riverton.....	2,400	2,400								
Total.....	1,556,964	2,385,799	1,502,001	35,284	1,242,116	1,271,057	6,116	492	1,423,307	
Arizona:										
Salt River.....	3,180	5,754	40,667		49,601					
California-California: Yuma.....		286	1,346	1,000	1,346					
Colorado:										
Orland.....										
Grand Valley.....	20,744	910,194	122,555		143,899	23,377				
Uncompahgre.....	8,197		1,068,980		2,008,381	53,510				
Idaho:										
Boise.....	3,958	84,029	1,156,346	4,524	1,248,857					
King Hill.....		523	30,377		21,200					
Minidoka.....	31,845	6,791	1,662,115		1,720,431	67,972				
Gravity division.....	22,689	2,891	835,968		33,200					
Pumping division.....	8,856	3,900	871,727		884,483	32,772				
Montana:										
Huntley.....	21,617	494	2,722		24,774	49,573			8	
Milk River.....	102		18,443		18,545	8,196				
Sun River.....	70		32,630		32,630					
Fort Shaw division.....	60		29,860		29,910	1,559				
Greenfields and Big Coulee.....	10		2,770		2,780	213				
Montana-North Dakota: Lower Yellowstone.....	8,828		13,355		22,183	60,202				
Nebraska-Wyoming:										
North Platte.....	11,920	8,025	1,092,801		1,112,746	308,627			571	
Interstate division.....	2,286		885,368		887,654	180,648			362	
Fort Laramie division.....	9,579	8,025	154,352		171,956	113,794			209	
Northport division.....	55		3,061		3,136	13,965				
Nevada: Newlands.....		2,905	20,833		23,738					



# ANNUAL REPORT OF THE COMMISSIONER OF RECLAMATION

State and project	Vegetables and truck						Miscellaneous		
	Beans	Onions	White potatoes	Sweet potatoes	Total	Sugar beets	Cotton	Cotton-seed	Cane
	Bushels	Bushels	Bushels	Bushels	Bushels	Tons	Pounds	Pounds	Tons
Oregon-California:									
Klamath.....			95,467		95,467	1,450			1,350
Main division.....			94,262		94,262	1,250			1,350
Tule Lake division.....			1,205		1,205				
South Dakota: Belle Fourche.....			12,206		12,206	19,997			
Utah: Strawberry Valley.....	4,738	11,269	27,635		43,632	61,298			
Washington:									
Okanogan.....			2,010		2,010				
Yakima.....	8,944	18,970	2,411,470		2,438,884				
Sunnyside division.....	5,877		2,167,793		2,173,280				
Tieton division.....	3,267	18,970	244,167		266,504				
Wyoming:									
Shoshone.....	24,114	6,500	202,002		232,616	23,496			
Gardland division.....	28,734	6,500	187,424		217,658	19,823			
Framme division.....	380		14,568		15,948	3,668			
Total.....	183,120	1,078,400	8,055,880	33,899	9,321,009	679,381	83,011,470	153,769,794	10,554

State and project	Fruits and nuts						Total		
	Apples	Peaches	Pears	Prunes	Citrous fruit	Small fruit	Miscellaneous		
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Arizona: Salt River.....					20,660,000	62,700	20,360,000	46,910,000	83,000
Arizona-California:									
Yuma.....					1,350			27,969	975,875
Yuma auxiliary (mesa).....					967,875			7,500	2,199,800
California: Orland.....	13,500	207,500	23,000	518,000	680,250	330,500		427,050	
Colorado:									
Grand Valley.....		2,835,259	8,320	15,000		90,400		2,835,260	6,790,645
Uncompahgre.....	6,647,985								
Idaho:									
Boise.....	5,597,976	1,000	7,850	1,322,128		52,900		6,981,864	
Klug Hill.....	1,036,186		22,000	110,000		3,000		1,171,186	
Mindaka.....	468,373					18,610		516,983	
Gravity division.....	468,373					18,610		516,983	



## Summary of crop report on Government reclamation projects in 1925—Value—Continued

State and project	Cereals						Other grain and seed					
	Barley	Corn	Oats	Rye	Wheat	Total	Alfalfa seed	Clover seed	Sorghum grain	Flaxseed	Millet seed	Total
Nebraska-Wyoming:												
North Platte.....	\$295,544	\$599,262	\$194,836	\$8,561	\$331,020	\$1,399,223	\$4,628	\$6,228		\$2,250	\$1,642	\$15,748
Interstate division.....	205,233	292,373	38,776	5,963	38,756	690,213	3,228	5,316			606	9,150
Fort Laramie division.....	84,903	224,464	112,287	1,904	266,354	690,813	2,400	312		2,250	564	5,698
Northport division.....	5,488	42,425	15,671	704	25,910	90,198		600			472	1,072
Nevada: Northwest.....	22,080	13,710	1,330		141,165	178,235						
New Mexico: Carlsbad.....		1,120				1,120						
New Mexico-Texas: Rio Grande.....	670	135,256	2,062		11,871	146,849			\$6,008			38,379
Oregon: Umatilla.....	982	7,350	30		3,177	11,539	2,948					6,586
Oregon-California:												
Klamath.....												
Main division.....	11,065		9,315	8,856	72,747	101,973						
Tule Lake division.....	10,615		8,937	8,023	70,106	97,681						
South Dakota: Belle Fourche.....	440		8,378	833	2,641	4,282						
Utah: Strawberry Valley.....	18,205	202,011	87,592	1,581	84,849	394,238	9,971	553				10,524
Washington:	25,742	628	34,240		266,829	327,439	1,071	567				1,638
Okanogan.....		150				150						
Yakima.....	30,636	202,316	29,286		319,977	582,215		3,360				3,360
Sunnyside division.....	17,223	166,489	28,066		243,736	450,534						
Tieton division.....	13,413	35,827	6,200		76,241	131,681		3,360				3,360
Wyoming:												
Shoshone.....	20,819	2,813	46,013		87,978	157,623	3,228	13,453				16,681
Garland division.....	20,604	1,376	33,715		75,903	131,498	2,568	9,198				11,766
Franklin division.....	315	1,437	12,268		12,075	26,125	600	4,255				4,915
Riverton.....			1,200			1,200						
Total.....	958,574	1,741,676	662,583	23,036	4,598,345	7,984,214	764,843	253,627	7,949	6,862	2,228	1,035,300
State and project	Hay and forage					Total	Vegetables and truck					
	Alfalfa hay	Clover hay	Other hay	Corn fodder	Other forage		Beans	Onions	White potatoes	Sweet potatoes	Truck	Total
Arizona: Salt River.....			\$424,177	\$286,056	\$619,773	\$7,429,777					\$3,316,375	\$3,444,131
Arizona-California:												
Yuma.....	597,795		3,561		173,399	825,487		90	\$2,437	187,550	190,584	
Yuma auxiliary (Mesa).....	60				15	75				215	215	

California: Orland.....	222,425		8,400	3,915	6,320	17,844	268,904			1,200	5,140	6,340
Colorado:												
Grand Valley.....	161,312		1,708		9,330	5,927	178,285			102,885	39,199	249,801
Uncompahgre.....	421,810		2,358	1,640	8,604	32,992	468,585			945,249	38,144	1,570,348
Idaho:												
Boise.....	763,257	12,991	4,392		20,481	172,346	1,003,467			444,004	36,575	573,609
King Hill.....	85,071	707	30	196		13,143	99,137			18,007	8,933	26,249
Mimidsote.....	820,911	17,968	886	7,280	1,500	76,082	924,567			2,270,855	40,742	2,394,066
Gravity division.....	520,508	14,144	886	1,125		45,772	562,383			1,094,024	28,002	1,177,371
Pumping division.....	300,405	3,824		6,165	1,500	30,280	342,184			1,176,881	14,740	1,216,725
Montana:												
Huntley.....	117,394	264	1,323	1,157	19,828	31,956	171,953			4,734	15,886	74,060
Milk River.....	75,463		55,105	7,219	948	2,186	140,920			34,292	8,520	43,114
Sun River.....	122,462		2,534	1,000		7,489	124,266			44,027	9,117	53,448
Fort Shaw division.....	70,614	155	487	412		5,978	77,646			40,297	5,862	46,411
Green Fields and Big Coulee.....	51,849	655	2,047	588		1,511	56,650			3,740	3,256	7,087
Montana-North Dakota: Lower Yellowstone.....	87,315	364	1,164	7,136	27,806	5,500	129,287			20,082	42,263	79,950
Nebraska-Wyoming:												
North Platte.....	514,677	5,080	19,860	4,550		19,422	563,539			1,147,441	25,887	1,202,508
Interstate division.....	376,788	4,680	3,980	3,544		12,072	401,014			962,136	19,157	1,005,408
Fort Laramie division.....	119,325	100	15,760	1,006		7,191	143,382			162,070	5,660	183,016
Northport division.....	18,564	250	170			7,159	19,143			3,235	5,750	4,084
Nevada: Newlands.....	682,467		3,368			47,522	733,387			28,125	88,318	115,555
New Mexico: Carlsbad.....	168,988				10,665	40,400	180,053			380	532,079	583,749
New Mexico-Texas: Rio Grande.....	1,248,789		9,173			28,219	1,286,181			720	28,683	41,076
Oregon: Umatilla.....	235,717	430	680	2,404		26,569	284,800			12,353		
Oregon-California:												
Klamath.....	268,240		10,556			124,857	403,653			128,880	14,118	142,988
Main division.....	240,432		9,611			123,007	373,069			127,264	13,238	140,492
Tule Lake division.....	27,808		945			1,850	30,603			1,036	13,890	2,506
South Dakota: Belle Fourche.....	219,193	255	11,434	5,220		32,199	268,301			18,309	31,644	49,853
Utah: Strawberry Valley.....	358,582	357	2,179	3,168	4,572	9,839	378,697			38,186	111,900	181,452
Washington:												
Okanogan.....	3,360		2,140	1,270		765	7,535			3,618	11,320	14,988
Yakima.....	1,257,714		25,417	4,552	63,721	226,790	1,588,184			8,135,481	329,281	3,496,104
Stunyside division.....	1,060,810		19,845	3,144	46,494	198,060	1,348,373			2,818,014	308,306	3,136,945
Tieton division.....	176,904		5,572	1,408	17,227	38,700	239,811			317,417	20,925	3,339,189
Wyoming:												
Shoshone.....	273,496	335	460	1,525	1,122	31,100	308,088			62,965	28,032	283,557
Garland division.....	226,542	270	340	1,345		27,590	269,087			178,030	22,689	282,734
Franklin division.....	36,954	65	120	1,180	1,122	3,510	41,951			14,568	5,343	20,823
Total.....	14,051,846	40,732	590,873	332,027	974,376	17,767,127	370,439	769,669	8,703,287	44,880	4,945,598	14,833,873

## Summary of crop reports on Government reclamation projects in 1925—Value—Continued

State and project	Fruits and nuts						Miscellaneous					Grand total	
	Apples	Peaches	Pears	Prunes	Citrous fruit	Small fruit	Miscellaneous	Total	Sugar beets	Cotton	Cane		Other
Arizona: Salt River.....					\$228,250	\$416,240	\$354,000	\$1,699,490		\$3,888,511		\$16,775	\$8,905,286
Arizona-California:													
Yuma.....					68	3,510	10,465	14,043		3,061,286	\$2,090	37,216	3,100,592
Yuma Auxiliary (Mesa).....					28,075	750	25	29,850					30,178
California: Orland.....	\$750	\$4,150	\$460	\$36,260	27,210	6,694	64,840	140,364		5,625		1,880	504,580
Colorado:													
Grand Valley.....		34,865						34,865	\$151,950			9,036	160,986
Uncompahgre.....	97,354	1,331	451	948		14,160		114,244	347,815			63,664	411,479
Idaho:													
Boise.....												4,364	4,364
King Hill.....	94,963	60	964	31,613		8,398		133,998				3,310	479,114
Mindokos.....	18,334		575	2,550		625		22,084	475,904			3,310	4,922,060
Gravity division.....	2,492					372		2,864	249,710			3,310	2,530,667
Pumping division.....	2,492					372		2,864	229,404				229,404
Montana:													
Huntley.....									322,278		32		322,310
Mill River.....						760		760	53,188				53,183
Sun River.....									10,632			361	10,993
Fort Shaw division.....									9,364			361	9,715
Greenfields and Big Cou- lee.....									1,278				1,278
Montana-North Dakota: Lower Yellowstone.....													
Nebraska-Wyoming:													
North Platte.....									361,272			1,045	362,317
Interstate division.....													
Fort Laramie division.....									1,944,350		2,284	20,063	1,966,697
Northport division.....									1,139,842		1,448	13,633	1,154,923
Nevada: Newlands.....									716,902		886	5,462	723,250
New Mexico: Carlsbad.....									88,106			968	89,074
New Mexico-Texas: Rio Grande.....	150							150				46,829	46,829
Oregon: Umatilla.....	130,509	22,214	112,241					266,723					
Oregon-California:	18,548												
Klamath.....				179		3,274	3,280	22,001		1,210,879	1,380	44,647	1,212,259
Main division.....										8,226,917	70,012	1,447	8,341,576
Tule Lake division.....													
South Dakota: Belle Fourche.....												10,261	10,261
Utah: Strawberry Valley.....	27,439	900				16,409	215	43,968	164,975			2,206	167,386
Washington:									406,407			26,660	433,067
Okanogan.....	900,138	1,268	5,325			9,399		916,099				6,693	945,405

Yakima.....	4,280,351	300,192	818,411	183,559	---	405,212	34,440	6,182,165	---	199,040	199,040	12,004,068
Sunnyside division.....	2,616,981	160,352	625,391	183,559	---	290,692	---	3,885,975	---	183,940	183,940	8,978,767
Tieton division.....	1,768,379	149,840	193,020	---	---	105,520	24,440	2,246,190	---	45,100	45,100	3,025,261
Wyoming:												
Shoshone.....	31	---	---	---	---	---	---	31	---	---	---	930,452
Gariand division.....	31	---	---	---	---	---	---	31	---	---	---	810,857
Frannie division.....	---	---	---	---	---	---	---	---	---	---	---	119,595
Riverton.....	---	---	---	---	---	---	---	---	---	---	---	1,200
Total.....	5,671,079	364,980	938,427	264,100	984,603	915,252	468,419	9,606,869	4,413,738	21,398,218	26,379,488	77,608,880

Irrigation and crop results, Government reclamation projects, 1955<sup>1</sup>

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually a partial water supply through private canals under Warren Act contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River <sup>4</sup>	226,000	235,620	217,900	\$22,456,640	\$103.06	92,700	13,400			
Arizona-California:										
Yuma	64,870	55,900	55,770	4,718,845	84.61	2,550	2,550	2,210	\$227,800	\$103.00
Yuma auxiliary (Mesa)			81	30,178	363.59					
California: Orland	20,660	13,955	11,327	504,580	44.35					
Colorado:										
Grand Valley	30,350	13,490	13,110	693,320	52.89	18,350	12,000	11,400	1,145,000	100.00
Uncompangre	94,820	61,637	61,294	3,052,365	49.47	2,010	1,800	1,800	93,000	51.67
Idaho:										
Boise	143,200	95,738	93,998	3,323,777	35.47	140,290	131,300	126,300	4,029,107	31.90
King Hill	16,840	6,024	5,992	183,319	30.80					
Mindoka	121,870	102,331	96,735	4,922,080	51.04	650,000	535,500	488,000	26,400,000	54.00
Gravely division	72,610	57,314	53,838	2,839,067	47.17					
Pumping division	48,960	45,037	41,917	2,352,423	56.34					
Montana:										
Huntley	32,540	18,940	19,310	744,870	38.57					
Milk River <sup>5</sup>	38,960	21,690	21,690	328,118	15.15	41,200	27,600	27,600	516,700	18.72
Sun River	56,820	20,458	27,044	534,055	19.74					
Fort Shaw Division	13,900	7,456	7,778	165,560	21.28					
Greenfields and Big Coulee division	* 42,920	* 13,012	19,266	368,496	19.13					
Montana-North Dakota: Lower Yellowstone	* 58,240	18,276	18,276	642,163	35.14					
Nevada: North Platte	236,750	161,806	144,880	5,137,715	35.46	127,160	105,880	105,000	4,042,650	38.50
Interstate division	113,400	84,118	73,117	3,190,208	37.68					
Fort Laramie division	107,000	68,262	62,978	1,764,936	26.18					
Northport division	16,330	9,426	8,735	203,571	21.60					
Nevada: Newlands	66,385	42,453	38,617	1,073,966	27.81					
New Mexico: Carlsbad	25,045	24,778	22,861	1,433,059	62.69					
New Mexico-Texas: Rio Grande	150,000	130,911	121,799	10,676,614	87.66	44,000	31,070	31,070	1,928,175	62.60
Oregon: Umatilla	24,590	13,345	13,847	363,811	28.32					
Oregon-California:										
Klamath	41,970	24,493	33,354	671,669	20.13	34,070	21,040	21,040	390,480	18.08
Main division	41,920	32,489	31,847	633,263	19.90					
Tule Lake division	3,060	1,684	1,517	38,400	25.30					

South Dakota: Belle Fourche.....	81,820	48,800	53,120	891,254	16.78	19,500	18,300	18,200	676,463	37.17	52
Utah: Strawberry Valley.....	53,860	33,775	31,761	1,365,286	42.99						
Washington:											
Okanogan.....	7,580	4,978	4,414	945,406	214.18						
Yakima.....	134,340	122,650	101,574	12,004,068	118.18						
Sunnyside division.....	102,840	96,000	78,474	8,978,767	114.42						52
Tieton division.....	32,000	27,650	23,100	3,025,301	130.97						
Wyoming:											
Shoshone.....	61,980	36,663	36,226	930,453	25.08						
Gardland division.....	41,920	29,609	29,626	810,857	27.46						
Fraunie division.....	20,060	7,054	6,700	119,695	17.86						
Riverton division.....	1,600	80	80	1,200	18.00						
Total.....	1,802,970	1,320,300	1,242,750	77,608,880	62.45	1,340,000	1,019,170	961,250	53,655,850	56.40	

<sup>1</sup> Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1924, to September, 1925.

<sup>2</sup> Area Bureau of Reclamation was prepared to supply water.

<sup>3</sup> Irrigated crops. Excludes small areas on few projects cropped by dry farming.

<sup>4</sup> Data furnished by Salt River Valley Water Users' Association, which operates the project.

<sup>5</sup> Includes 10,716 acres reported as vacant, 3,460 acres of "home tracts," and 3,544 acres within town sites on which no crops were reported.

<sup>6</sup> Considerable area cropped without irrigation.

<sup>7</sup> Crop reports covered an additional area of 37,240 acres cropped by dry farming valued at \$179,180, or \$4.81 an acre.

<sup>8</sup> Crop reports covered an additional area of 5,640 acres cropped by dry farming valued at \$30,630, or \$14.29 an acre.

<sup>9</sup> Crop reports covered an additional area of 12,918 acres cropped by dry farming valued at \$186,118, or \$14.41 an acre.

<sup>10</sup> 60,000 acre-feet of water annually delivered under treaty with Mexico.



## Summary of crop reports on reclamation projects in 1925

NOTE.—These figures are limited to irrigated crops covered by crop census on Government projects proper, excluding for the most part dry-farm crops, and all crops in most areas served water under the the Warren Act.

Crop	Acreage cropped		Yields				Crop value	
	Total	Per cent of cropped	Unit	Total	Average per acre	Average per acre	Total	Per cent of total value of all crops
<b>Cereals:</b>								
Barley.....	43,407	3.5	Bushels.....	1,556,964	35.8	\$22.08	\$958,574	1.2
Corn.....	86,353	6.9	do.....	2,385,769	27.6	20.17	1,741,676	2.2
Oats.....	40,750	3.3	do.....	1,502,601	37.0	16.26	662,583	.9
Rye.....	2,580	.2	do.....	35,284	13.7	9.00	23,086	-----
Wheat.....	126,113	10.1	do.....	3,398,068	26.9	36.46	4,598,345	6.0
<b>Total.....</b>	<b>299,203</b>	<b>24.0</b>	-----	<b>8,869,681</b>	<b>29.6</b>	<b>27.00</b>	<b>7,984,214</b>	<b>10.3</b>
<b>Other grain and seed:</b>								
Alfalfa seed.....	21,021	1.7	Bushels.....	79,809	3.8	36.43	764,843	1.0
Clover seed.....	5,729	.5	do.....	25,458	4.4	44.30	253,627	.3
Grain sorghum.....	220	-----	do.....	6,509	29.5	36.13	7,949	-----
Flaxseed.....	467	-----	do.....	3,020	6.4	14.28	6,662	-----
Millet seed.....	162	-----	do.....	1,242	7.6	14.00	2,228	-----
<b>Total.....</b>	<b>27,599</b>	<b>2.2</b>	-----	<b>116,038</b>	<b>4.2</b>	<b>37.51</b>	<b>1,085,309</b>	<b>1.3</b>
<b>Hay and forage:</b>								
Alfalfa hay.....	423,829	34.1	Tons.....	1,271,057	3.0	33.15	14,051,846	18.1
Clover hay.....	4,363	.4	do.....	6,116	1.4	9.83	40,782	-----
Other hay.....	34,872	2.8	do.....	47,492	1.4	17.00	590,572	.8
Corn fodder.....	6,762	.6	do.....	45,928	6.8	49.10	332,027	.4
Other forage.....	46,290	3.7	do.....	52,714	1.1	21.00	974,876	1.3
Pasture.....	191,212	15.3	-----	-----	-----	9.35	1,777,273	2.3
<b>Total.....</b>	<b>707,328</b>	<b>56.9</b>	-----	<b>1,428,307</b>	-----	<b>25.12</b>	<b>17,767,127</b>	<b>22.9</b>
<b>Vegetables and truck:</b>								
Beans.....	9,986	.8	Bushels.....	153,120	15.3	37.10	370,439	.5
Onions.....	4,358	.4	do.....	1,678,460	247.4	176.61	769,669	1.0
Potatoes, white.....	33,192	2.6	do.....	8,065,530	242.7	262.21	8,703,267	11.2
Potatoes, sweet.....	354	-----	do.....	33,899	96.0	127.60	44,880	-----
Truck.....	28,260	2.3	-----	-----	-----	175.00	4,945,598	6.4
<b>Total.....</b>	<b>76,150</b>	<b>6.1</b>	-----	<b>9,321,008</b>	-----	<b>194.80</b>	<b>14,833,873</b>	<b>19.1</b>
<b>Fruits and nuts:</b>								
Apples.....	23,819	2.0	Pounds.....	276,373,232	11,608.0	238.10	5,671,079	7.3
Peaches.....	2,286	.1	do.....	12,060,349	5,275.3	159.70	364,980	.5
Pears.....	4,153	.3	do.....	27,812,746	6,697.0	225.96	938,427	1.2
Prunes.....	1,345	.1	do.....	7,506,707	5,577.5	197.10	265,109	.3
Citrus fruit.....	2,545	.2	do.....	23,290,476	8,431.0	372.63	966,603	1.3
Small fruit.....	3,375	.3	do.....	29,103,994	8,623.4	271.20	915,252	1.2
Miscellaneous.....	4,086	.3	do.....	7,315,700	1,790.4	114.64	408,419	.6
<b>Total.....</b>	<b>41,709</b>	<b>3.3</b>	-----	<b>362,465,208</b>	<b>9,170.0</b>	<b>230.38</b>	<b>9,608,869</b>	<b>12.4</b>
<b>Miscellaneous:</b>								
Sugar beets.....	55,061	4.4	Tons.....	679,381	12.3	80.13	4,413,738	5.7
Cotton.....	215,967	17.4	Pounds.....	83,011,470	384.3	99.00	21,393,218	27.6
Cotton seed.....			-----	153,759,794	712.0	-----	-----	-----
Cane.....	2,674	.2	Tons.....	10,554	4.0	28.27	75,798	.1
Other crops.....	6,444	.5	-----	-----	-----	77.15	496,734	.6
<b>Total.....</b>	<b>280,166</b>	<b>22.5</b>	-----	-----	-----	<b>94.20</b>	<b>26,379,488</b>	<b>34.0</b>
Duplication.....	189,405	15.0	-----	-----	-----	-----	-----	-----
All crops.....	<b>1,242,750</b>	<b>100.0</b>	-----	-----	-----	<b>62.45</b>	<b>77,608,880</b>	<b>100.0</b>

## LIVESTOCK AND EQUIPMENT

Inventory of livestock and equipment on reclamation project farms at close of 1925<sup>1</sup>

State and project	Horses			Mules			Cattle				Sheep			Hogs				
	Num-ber	Value		Num-ber	Value		Beef		Dairy		Num-ber	Value		Num-ber	Value			
		Each	Total		Each	Total	Num-ber	Value	Each	Total		Num-ber	Value					
Arizona: Salt River.....	8,412	\$40.00	\$420,000	3,321	\$50.00	\$265,680	17,781	\$35.24	\$255,645	18,082	\$85.00	\$1,534,420	14,013	\$4.50	\$63,088	2,985	\$16.00	\$47,760
Arizona: California.....	2,969	61.88	183,720	1,166	77.65	90,548	971	41.18	40,980	1,554	71.79	111,521	782	8.54	6,678	1,128	13.38	15,037
Yuma Auxiliary.....	28	97.60	2,780	11	98.18	1,080	232	20.00	5,045	3,218	70.00	241,990	12,207	8.80	10,839	1,236	19.50	24,044
California: Orland.....	1,076	56.36	60,660	68	74.32	4,868	1,890	38.93	51,297	1,890	38.93	51,297	8,328	8.45	53,466	866	16.89	9,717
Colorado: Grand Valley.....	5,420	43.48	246,486	219	55.30	12,110	4,700	35.36	166,187	28,199	9.94	280,148	4,665	9.94	280,148	4,665	10.37	47,866
Uncompangre.....	5,599	39.82	223,016	171	47.34	8,095	3,094	50.56	166,455	9,607	42.28	406,725	9,068	8.05	77,523	11,914	11.06	130,915
Idaho: Boise.....	3,863	53.00	204,771	7	70.00	490	238	34.41	7,856	644	50.00	32,190	9,982	13.00	129,405	414	13.55	5,609
King Hill.....	4,667	30.97	144,547	63	52.70	3,320	648	31.40	20,374	3,992	63.19	252,241	9,020	9.27	83,005	4,631	9.37	42,840
Minidoka—	2,332	49.72	115,954	17	58.23	990	399	31.14	12,425	2,610	51.48	134,365	8,693	7.81	67,877	4,499	10.07	45,280
Gravity division.....	2,037	44.06	94,386	2,435	55.20	134,400	1,668	34.10	56,595	1,948	87.00	72,880	7,439	8.08	59,034	1,572	11.12	17,478
South Side pumping division.....	1,593	44.25	70,690	114	44.00	5,015	3,378	39.03	131,855	914	66.32	51,900	24,624	9.13	236,465	1,418	15.00	21,262
Montana: Huntley.....	570	46.25	26,365	9	61.11	550	382	33.95	12,970	849	46.51	39,489	1,101	9.16	10,090	416	13.95	5,807
Milk River.....	1,198	44.78	53,645	15	48.38	725	1,333	38.16	49,930	1,006	38.18	38,415	7,196	11.80	84,964	1,027	12.55	12,862
Sun River.....	1,862	42.00	78,204	41	60.00	2,460	1,711	32.60	55,763	1,947	50.20	97,847	3,243	11.00	35,670	3,357	13.00	32,677
Fort Shaw division.....																		
Greenhields division.....																		
Lower Yellowstone.....																		
Nebraska: North Dakota: Lower Yellowstone																		
North Platte—																		
Wyo ming:																		
Interstate division.....	5,571	40.00	222,840	305	65.00	19,825	7,603	25.00	190,075	5,284	45.00	237,780	1,779	8.00	14,232	9,654	7.00	67,578
Fort Laramie division.....	3,332	40.00	133,280	152	65.00	9,880	2,816	25.08	70,400	1,752	45.00	78,949	41	8.00	3,208	5,557	7.00	37,869
Northport division.....	538	40.00	21,520	62	65.00	4,030	714	25.00	17,850	5,895	45.00	265,521	25	8.00	200	627	7.00	4,389
Nevada: Newlands.....	3,055	52.18	159,400	167	53.00	8,867	4,663	49.40	230,342	8,184	85.00	695,521	12,807	9.80	125,573	1,872	12.74	23,120

<sup>1</sup> Data are for calendar year except on Salt River project, where data are for "agricultural year," October, 1924, to September, 1925.

: Horses and mules.

: Dairy and beef cattle.

## Inventory of livestock and equipment on reclamation project farms at close of 1925—Continued

State and project	Horses			Mules			Cattle						Sheep			Hogs		
	Num-ber	Value		Num-ber	Value		Beef		Dairy		Value		Num-ber	Value		Num-ber	Value	
		Each	Total		Each	Total	Num-ber	Each	Total	Num-ber	Each	Total		Each	Total			
New Mexico: Carlsbad.....	1,028	\$33.27	\$34,020	555	\$36.70	\$20,475	550	\$28.35	\$15,590	377	\$61.47	\$23,175	4,135	\$10.16	\$42,031	71	\$15.38	\$1,092
New Mexico-Texas: Rio Grande.....	9,553	64.18	420,538	2,638	87.14	231,177	788	29.74	23,433	6,373	81.78	521,374	2,447	5.80	14,164	1,343	12.28	16,453
Oregon: Umatilla.....	1,041	46.11	48,000	31	53.00	1,643	186	38.72	7,202	2,784	54.82	182,619	7,164	9.16	65,459	845	15.21	12,852
Oregon-California: Klamath—																		
Main division.....	1,444	75.00	108,300	12	90.00	1,080	3,080	.35	107,100	3,224	60.00	190,040	20,462	11.00	324,082	1,302	15.00	19,530
Tule Lake division.....	105	76.78	7,875	2	90.00	180	110	.35	3,850	255	60.00	15,300	10,196	11.00	2,156	56	15.00	840
South Dakota: Belle Fourche.....	3,786	52.43	145,465				3,277	33.22	108,885	8,714	36.78	136,800	46,481	9.03	419,557	6,141	11.69	71,843
Utah: Strawberry Valley.....	3,280	70.00	229,600	81	70.00	5,670	12,729	31.00	394,599	3,600	55.00	195,000	13,000	10.00	180,000	2,878	13.00	51,804
Washington: Okanogan.....	308	45.71	13,805				525	145.70	4,160	309	52.07	16,091				239	15.50	5,100
Yakima.....																		
Sunnyside division.....	6,282	57.44	361,423	210	69.59	14,615	1,405	47.25	66,246	12,063	53.95	687,041	14,457	10.36	149,780	8,087	13.77	111,414
Tieton division.....	1,557	63.01	98,105	70	73.26	5,130	191	29.79	5,690	2,752	62.76	172,705	777	9.34	7,238	2,003	14.47	28,983
Wyoming: Shoshone—																		
Gardiner division.....	1,471	61.35	90,260	115	71.87	8,231	551	28.14	15,507	1,720	43.82	75,378	5,581	7.19	39,980	666	11.82	7,873
Framme division.....	424	51.48	21,830	12	86.58	715	89	29.38	2,615	551	40.87	22,520	688	9.97	6,857	249	13.09	3,261
Riverton.....	4	100	400															
Total and average.....	77,776	50.91	3,959,923	9,666	78.36	759,748	79,194	34.00	2,682,820	104,937	61.23	6,428,036	275,815	9.40	2,588,678	31,613	11.41	934,193

\* Sheep and goats.

\* Horses and mules.

